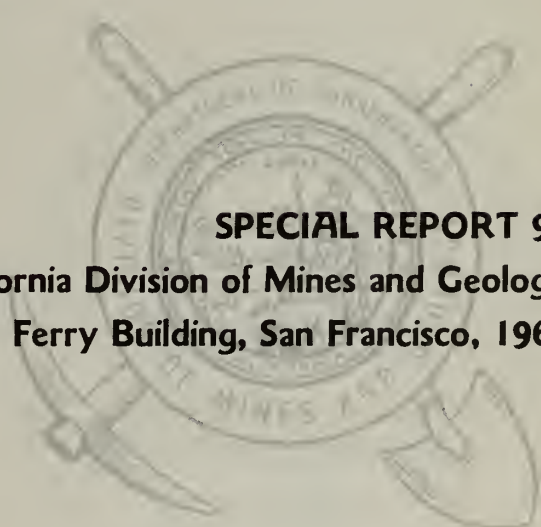


California Division of Mines and Geology

# GRAVITY BASE STATION NETWORK

RODGER H. CHAPMAN

Physicist, California Division of  
Mines and Geology, San Francisco, California



**SPECIAL REPORT 90**  
California Division of Mines and Geology  
Ferry Building, San Francisco, 1966

State of California  
EDMUND G. BROWN, Governor

The Resources Agency  
HUGO FISHER, Administrator

Department of Conservation  
DeWITT NELSON, Director

Division of Mines and Geology  
IAN CAMPBELL, State Geologist

Special Report 90

Price: \$1.50

## CONTENTS

	Page
Abstract .....	5
Introduction .....	7
Gravity measurements .....	7
Previous work .....	8
Instrumentation .....	9
Method and reductions .....	9
Results of the study.....	10
Comparison with other gravity bases .....	10
Conclusions .....	13
References .....	15
Appendix .....	17

## ILLUSTRATIONS

Page	
In pocket	Plate 1. Index map showing locations of California Division of Mines and Geology gravity base stations.
8	Figure 1. Comparison of California Division of Mines and Geology gravity values with U. S. Geological Survey values for Yosemite calibration loop.
11	Figure 2. Comparison of California Division of Mines and Geology observed gravity values with Woollard and Rose values.
12	Figure 3. Comparison of U. S. Coast and Geodetic Survey pendulum values with California Division of Mines and Geology gravimeter values.
14	Figure 4. Index to California Division of Mines and Geology gravity base stations.

## ABSTRACT

A network of gravity stations consisting of approximately 360 sites in California and adjacent states has been established in order to facilitate compilation of gravity data and to provide base stations for future gravity surveys. The LaCoste-Romberg geodetic gravity meter used for most of the survey has a large reading range, a low drift rate, and a high reading sensitivity. The meter calibration was based indirectly on the North American gravity standardization range, and is believed to be accurate to at least one part in 5000. The prime base for the network was the gravity station established by Behrendt and Woollard at the San Francisco International Airport, but auxiliary bases at Palo Alto and Los Angeles were also utilized.

The observation sites, which are chiefly bench marks, were occupied in a series of loops using ground transportation, except for air ties to the Los Angeles base. Repeated observations were made at 43 key stations on different loops in order to provide an estimation of the internal accuracy of the network.

Comparative values were obtained at many of the gravity bases established in recent years by Woollard, Harrison and Corbato and others in California. The results of these ties indicate satisfactory agreement at almost all stations. Ties to the U.S. Coast and Geodetic Survey pendulum stations in the state indicate that many of the pendulum values are in error by three milligals or more.

The results of the ties and network evaluation show that most of the gravity values obtained in this study have a reliability within  $\pm 0.10$  milligal, with reference to the calibration and prime base station value used. Station descriptions and values of observed gravity, elevation, latitude, and simple Bouguer anomalies are presented.



# THE CALIFORNIA DIVISION OF MINES AND GEOLOGY GRAVITY BASE STATION NETWORK

BY

RODGER H. CHAPMAN<sup>1</sup>

## INTRODUCTION

The force of gravitational attraction at any point on the earth's surface depends on a number of factors which include elevation, latitude, time (tidal effects) and the density distribution of rocks on and beneath the surface. Because of the relationship between geology and the gravity field, measurements of gravity are often used in prospecting for oil, gas, and mineral deposits, and in other subsurface studies. Investigations of the gravity field on a larger scale yield information on the composition and nature of the earth's crust and the actual shape of the earth, which is of value in geodetic studies. Knowledge of the gravity field is also important in the space age because of the effect of anomalies on the orbits of earth satellites and missile trajectories.

The development of portable and accurate gravimeters has led to a rapidly increasing use of gravity methods by research organizations and universities, as well as private industry. This has resulted in a need for reliable gravity control stations to which these measurements can be related. Some such stations have been established in California in recent years, but these are relatively few in number and not well distributed about the state.

The program described in this report was begun in 1962 and completed in 1964 by the Division of Mines and Geology, primarily to facilitate the compilation of data for the preparation of gravity maps of the state. Other objectives of the program were to provide a more adequate network of base stations throughout the state for use in future gravity surveys, and to check as many of the existing gravity bases in the state as possible in the time available. Many gravity

surveys in California have previously been based on stations of doubtful reliability, or on floating datum.

Observations were made at approximately 360 stations in California, three in Nevada, and one in Oregon (Plate 1), using LaCoste-Romberg geodetic gravity meter No. 22 for most of the stations, and Worden meter No. 558, which had been checked on the same calibration ranges, for the remainder.

*Acknowledgements.* The LaCoste-Romberg geodetic gravity meter used for this program was made available to the Division of Mines and Geology through the courtesy of Thane McCulloh of the University of California at Riverside. Howard Oliver and Don Mabey of the U. S. Geological Survey, and Charles Corbato of the University of California at Los Angeles, furnished information on gravity calibration ranges and other gravity bases in California. The writer is also indebted to the people mentioned above, as well as many others too numerous to mention, for providing encouragement as well as assistance in the completion of this project.

Charles C. Bishop of the Division of Mines and Geology staff assisted the writer with some of the field observations, and also assisted very materially with the reduction of the field data and the preparation of this report.

## GRAVITY MEASUREMENTS

The most common types of instruments used to measure gravity are pendulums and gravimeters (gravity meters). (The torsion balance, which measures gravity gradients and curvatures, was also used exten-

<sup>1</sup>Geophysicist, California Division of Mines and Geology, San Francisco. Manuscript submitted February 1965.

sively in the past, chiefly in the search for oil, but the modern gravimeter has largely replaced this instrument.)

The pendulum method involves the precise measurement of the period of a specially constructed pendulum. The value of the acceleration of gravity\* may then be determined from the following relationship:

$$T = 2\pi \sqrt{\frac{I}{mgl}}$$

where:

- T = period of the pendulum
- I = Moment of inertia about the knife edge
- m = mass of the pendulum
- l = distance from the knife edge to the center of gravity
- g = acceleration of gravity.

Pendulums can be used to measure either absolute values of gravity or relative gravity by comparison of periods, but the method is slow and requires elaborate equipment.

Modern gravimeters are relatively portable and fast-reading instruments, and are more sensitive to small changes in gravity than pendulums. They are used to measure gravity differences, but not absolute values. The operation of these instruments depends on the fact that the force of gravitational attraction on a

\* In geophysics, the unit of gravitational acceleration is the "gal" (1 cm/sec/sec), or the more convenient "milligal" (1 gal = 1000 milligals). The normal value of gravity at the surface of the earth is about 980 gals.

constant mass varies with any variation of the earth's gravity field. In practice, most gravimeters, including the LaCoste-Romberg instrument used in this survey measure minute displacements of a spring-suspended mass.

Gravimeter measurements are most commonly made on land, but instruments have been developed for use underwater, on ships, and in airplanes. Because gravimeters measure only relative values, accurate pendulum stations are often used to determine calibration constants for gravimeters.

For a more complete discussion of the theory of gravity measurements and instrumentation, any standard textbook on geophysics, such as Dobrin (1960 pp. 169-262) may be consulted.

## PREVIOUS WORK

Approximately 55 pendulum gravity stations have been occupied in California by the U. S. Coast and Geodetic Survey as part of a nationwide network (Duerkson, 1949). Many of these determinations were made almost 50 years ago, however, and recent published work (Woollard and Rose, 1963, pp. 128-142) indicates that some of them may be in error by five milligals or more. The U. S. Coast and Geodetic Survey is currently re-evaluating the pendulum network with gravimeter measurements and establishing additional gravity bases (Rice, 1965, pp. 209-211).

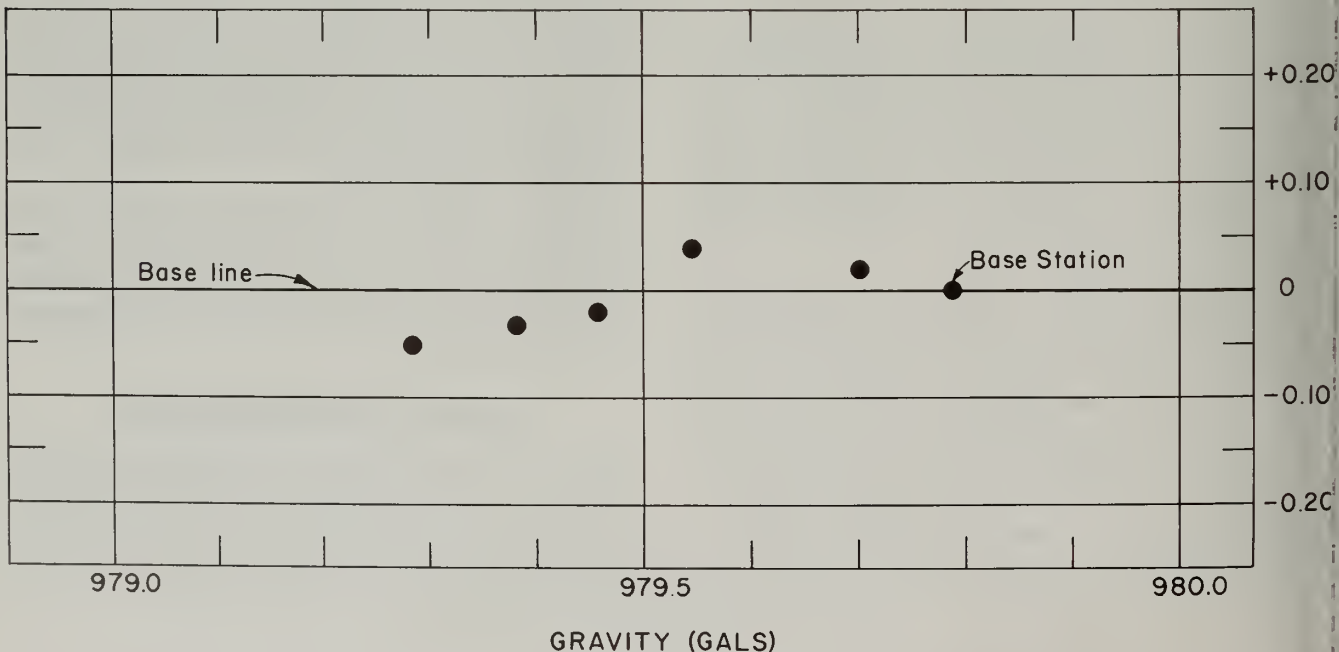


Figure 1. Comparison of California Division of Mines and Geology (G-22) gravity values (dots) with U.S. Geological Survey (G-17B) mean values (base line) for Yosemite calibration loop.



In a program beginning in 1954, Woollard (Woollard and Rose, 1963) established a network of airport gravity control stations in the United States. Approximately 22 of these (plus a few others located at harbor and university sites) are in California. Most of these stations are believed to have a reliability of about 0.1 or 0.2 milligal. However, because of construction at many airports within the past few years, some of these stations have been lost and others are difficult to locate.

A national network of airport stations occupied by the United States Air Force from 1959 to 1962 includes four stations in California (Thompson and others, 1962). Other stations, tied to the Woollard network, have been established in 1958 by Harrison and Corbato (1965) and the U. S. Geological Survey (I. W. Oliver, written communication, 1964).

### INSTRUMENTATION

The LaCoste-Romberg geodetic gravimeter G-22 proved to be nearly ideal for this program because the meter has a large reading range (does not require resetting), a low drift rate, and a reading sensitivity of about 5 microgals. In practice it was also found to be nearly free from tares (sudden jumps in readings).

The factory calibration of the meter was modified by a factor suggested by the manufacturer on the basis of tests of other LaCoste-Romberg meters on the North American gravity standardization range (D. F. Jones, written communication, 1962). The calibration was also checked at different times during this two-year period on the U. S. Geological Survey calibration ranges at Menlo Park and Yosemite National Park. Figure 1 shows a comparison between the observed gravity values obtained on the Yosemite loop by G-22 and a U. S. Geological Survey LaCoste-Romberg meter (G-17B) which had previously been checked on a part of the North American standardization range (I. W. Oliver, written communication, 1963). The comparison of gravity values on the Yosemite loop, plotted against gravity over a range of more than 500 milligals, indicates agreement between the meters to at least one part in 5000.

A few of the stations in the network were occupied with Worden gravimeter No. 558, which was calibrated on the Menlo Park calibration range against both G-22 and G-17B.

Woollard and Rose (1963, p. 23) have described a "creep" effect which evidently influences the calibration of many gravimeters. This is an apparent sinusoidal response which might be caused by imperfections in the linkage between the reading dial and the spring

system of the gravimeter. No special attempt was made to evaluate this effect for either gravimeter used in this study. However, the error must be relatively small in the case of meter G-22 in view of the very good agreement with other reliable meters found at stations throughout the range of gravity observed in the state (see Tables 3 and 4).

### METHOD AND REDUCTIONS

All measurements in the California Division of Mines and Geology network are based on Woollard's station WA 86 (station No. 163 of this network) at the San Francisco International Airport (Woollard and Rose, 1963, p. 41). The value of 979.98833 gals (J. C. Behrendt, written communication, 1964) used for this site, is based on ties to the University of Wisconsin pendulum base station at Madison, Wisconsin (Behrendt and Woollard, 1961, p. 61) which in turn, is based on ties to seven international gravity bases linked directly to the Potsdam, Germany, world pendulum base. Because of construction at the San Francisco Airport in 1962-63, the original base station, No. 163, has been lost. However, adequate ties were made to other nearby stations before this happened.

Auxiliary base stations were established in Palo Alto (No. 174) and Los Angeles (No. 319) for this program. The value used for the Palo Alto station is the mean of eight ties to station 163; the Los Angeles value is the mean of three ties to station 163 which are in close agreement: one air tie each by the California Division of Mines and Geology and the U. S. Air Force (Thompson and others, 1962), and one ground tie by J. C. Behrendt (written communication, 1964).

Observations for the base station network were made in a series of loops which were closed on either one of the two auxiliary base stations. Ground transportation was used except for the air ties to the Los Angeles station, and the individual loops were completed during time intervals ranging in length up to four days. Corrections for earth tides were made using the tables published annually by the European Association of Exploration Geophysicists (1961, 1962, 1963). After removal of tide effects and stopover drift, the residual instrumental drift usually averaged about 0.05 milligal per day. This was prorated around each loop of observations.

Second order stations were established with the Worden meter by tying directly to the nearest first order LaCoste-Romberg station.

Most of the stations occupied are U. S. Coast and Geodetic Survey and U. S. Geological Survey bench marks. In addition to the fact that the elevations of

the bench marks are known, these points are particularly well suited for use as base stations because the markers provide positive identification for the sites. Stations in desired areas were chosen for reasons of accessibility and probable permanence.

Forty-three key stations in the network were occupied from two to eight times on different loops. On most of these loops the gravity differences between key stations were in close agreement (see Table 1). However, on a few loops, instrumental tares ranging up to as much as 0.25 milligal were detected in certain gravity intervals. Where discrepancies were noted, repeat observations were made at a later date in order to identify and remove the error. Although these instrumental tares were evidently few in number, the exact cause or causes were never determined because they apparently were not associated with any known bumps, shocks, or incidents during transportation.

Table 1 shows the results obtained at the 43 key stations, including mean values of observed gravity, maximum deviations, and number of occupations. The greatest maximum deviation in the observed gravity values at any station in Table 1 is  $\pm 0.08$  milligal. This fact indicates that the internal accuracy of the network as a whole is on the order of  $\pm 0.1$  milligal.

New stations were occupied at four airports where earlier gravity bases have either been lost or are now in inconvenient locations. These airports include San Francisco (station 164), Los Angeles (station 320), Fresno (Station 244), and Reno, Nevada (stations 349, 350). Except at the Reno airport, where the old station is inaccessible, values were also obtained for reoccupation of the earlier airport bases.

Because of the loss of station 163 (WA 86) at the San Francisco International Airport due to construction in 1963, and the fact that station 165 (WA 87) is a poor site because of ground vibration and a high local gravity gradient, station 164 (U.S.C. & G.S. bench mark (WB-1) at the airport is recommended for future ties. This station has the advantage of relative stability, and is easy to find and identify (see Table 2).

## RESULTS OF THE STUDY

Table 2 (appendix) gives the station descriptions and observed gravity for all the stations occupied. Elevations, latitude, longitude, and simple Bouguer gravity calculated for a density of 2.67 are also given for all stations for which adequate data are available. Stations marked with an asterisk (\*) were established with the Worden meter.

Table 1. Gravity results at 43 key stations.

Station number* and location	Number of occupa- tions	Mean value observed gravity (gals)	Maximum deviation ( $\pm$ ) (milligals)
22 Susanville.....	2	979.8085	0.05
33 Redding.....	3	980.1354	0.06
39 Red Bluff.....	3	980.1086	0.06
45 Arcata.....	2	980.2224	0.01
52 Garberville.....	3	980.0928	0.05
62 Willits.....	3	980.0056	0.03
70 Willows.....	3	980.1058	0.06
73 Williams.....	3	980.0513	0.06
81 Oroville.....	2	980.0879	0.08
91 Truckee.....	2	979.5871	0.02
113 Jackson.....	2	979.8886	0.01
127 Sacramento.....	4	980.0145	0.05
128 Woodland.....	3	980.0359	0.07
142 Santa Rosa.....	3	980.0203	0.05
152 Vallejo.....	4	979.9960	0.05
163 San Francisco Airport.....	--	Base Station	--
173 Menlo Park.....	5	979.9587	0.03
174 Palo Alto.....	8	979.9561	0.08
180 Berkeley.....	2	979.9702	0.01
181 Livermore.....	2	979.9015	0.02
183 Lathrop.....	2	979.9513	0.03
185 Tracy.....	3	979.9352	0.02
186 Sonora.....	3	979.8321	0.02
189 Modesto.....	3	979.9310	0.06
192 San Jose.....	3	979.9003	0.03
195 Gilroy.....	2	979.9013	0.02
198 Los Banos.....	2	979.8477	0.01
199 Chowchilla Ranch.....	3	979.8786	0.02
200 Merced.....	4	979.9003	0.04
222 Mono Lake.....	2	979.3822	0.01
237 Olancho.....	2	979.4200	0.01
245 Fresno.....	2	979.8371	0.03
262 Paso Robles.....	2	979.7173	0.00
272 Bakersfield.....	3	979.7049	0.04
278 Mojave.....	3	979.4789	0.01
287 Needles.....	2	979.6233	0.03
295 Barstow.....	2	979.5087	0.00
300 Pomona.....	6	979.5498	0.04
315 Ventura.....	2	979.6000	0.01
319 Los Angeles.....	3	979.5946	0.03
327 Riverside.....	5	979.5320	0.06
330 Indio.....	2	979.5376	0.01
350 Reno.....	2	979.6894	0.02

\* For complete descriptions, see Table 2.

## COMPARISON WITH OTHER GRAVITY BASES

*Woollard's United States Network.* Values were obtained during the Division survey at 18 of the control stations given by Woollard and Rose (1963, pp. 41, 94, 122). An attempt was made to occupy the exact sites described in each case. Table 3 shows the gravity differences between the two sets of data to the nearest 0.01 milligal, based on data furnished by J. C. Behrendt (written communication, 1964). The comparison at the Reno, Nevada Airport (Woollard station WA 129) is based on a tie furnished by the U. S. Geological Survey (H. W. Oliver, written con-

communication, 1963). In figure 2, these gravity differences are plotted as a function of the value of gravity.

As shown in figure 2, the values at 11 of these stations are within 0.10 milligal, and except at Medford, Oregon, the difference exceeds 0.20 milligal at only two stations. The lack of any apparent systematic variation with gravity indicates near agreement in the calibration standards used.

Table 3. Comparison of the California Division of Mines and Geology (CDMG) and Woollard gravity values.

Station number <sup>1</sup> and location	A CDMG (gals)	B Woollard (gals)	Difference (A - B) (milligals)
6 Redding (WA 208)----	980.12925	980.1292-	+0.05
0 Red Bluff (WA 207)---	980.10445	980.1046-	-0.15
8 Eureka (US 238)----	980.22170	980.22194	-0.24
2 Santa Rosa (US 239)---	980.02030	980.02034	-0.04
0 San Francisco (GW 54)	979.98661	979.98673	-0.12
3 San Francisco (WA 86) Base Station	979.98833	979.98833	-----
5 San Francisco (WA 87)	979.98833	979.98856	-0.23
6 Stanford (WU 3)-----	979.94874	979.94886	-0.12
3 Fresno (WA 5)-----	979.83288	979.8328-	+0.08
9 Monterey (WA 84)-----	979.86912	979.86919	-0.07
9 Pasadena (WU 4)-----	979.57841	979.57832	+0.09
1 Los Angeles (WU 2)---	979.59771	979.59768	+0.03
5 Ventura (US 250)-----	979.59997	979.59999	-0.02
7 Santa Barbara (WA 88)	979.64075	979.64070	+0.05
3 Los Angeles (WA 83)---	979.59456	979.59459	-0.03
3 Oceanside (US 241)---	979.56642	979.56635	+0.07
3 San Diego (WA 85)---	979.53705	979.53698	+0.07
3 Medford, Ore. (WA 141)-----	980.23634	980.2375-	-1.16
Reno, Nevada (WA 129)-----	979.68722	979.6873-	-0.08

For complete descriptions of the stations, see Table 2 (appendix). The data were furnished by the U.S. Geological Survey.

At Medford, Oregon (station 348), the difference exceeds 1 milligal (1.16 mgal.). However, the published Woollard value at this station is believed to be in error because other recent observations (see Table 4) agree closely with the results of the present work and with an earlier value (980.2363) given by Woollard (1958, p. 534).

In the San Francisco Bay area, the three stations checked suggest a small shift in the datum used. The CDMG values at two of these stations (160, 176) are slightly more than 0.10 milligal lower than the comparative Woollard values, and the third (165) is more than 0.20 milligal lower. Because better agreement would be expected for stations so close to the prime base, these results suggest a possible error in the site used for reoccupation of WA 86 (163). This is not believed to be true because if it were, agreement with most of the rest of the Woollard stations that were checked throughout the state would be less satisfactory. If the three Bay area and Medford, Oregon stations, are eliminated, the mean difference (CDMG—Woollard) with regard to sign is only about -0.01 milligal. Without regard to sign the mean difference is 0.08 milligal in magnitude.

Harrison and Corbato gravity values. Thirteen of the stations established by Harrison and Corbato (1965, p. 213) with the LaCoste-Romberg geodetic meter DL-1 were reoccupied during this survey. The Harrison and Corbato stations are based on a value of

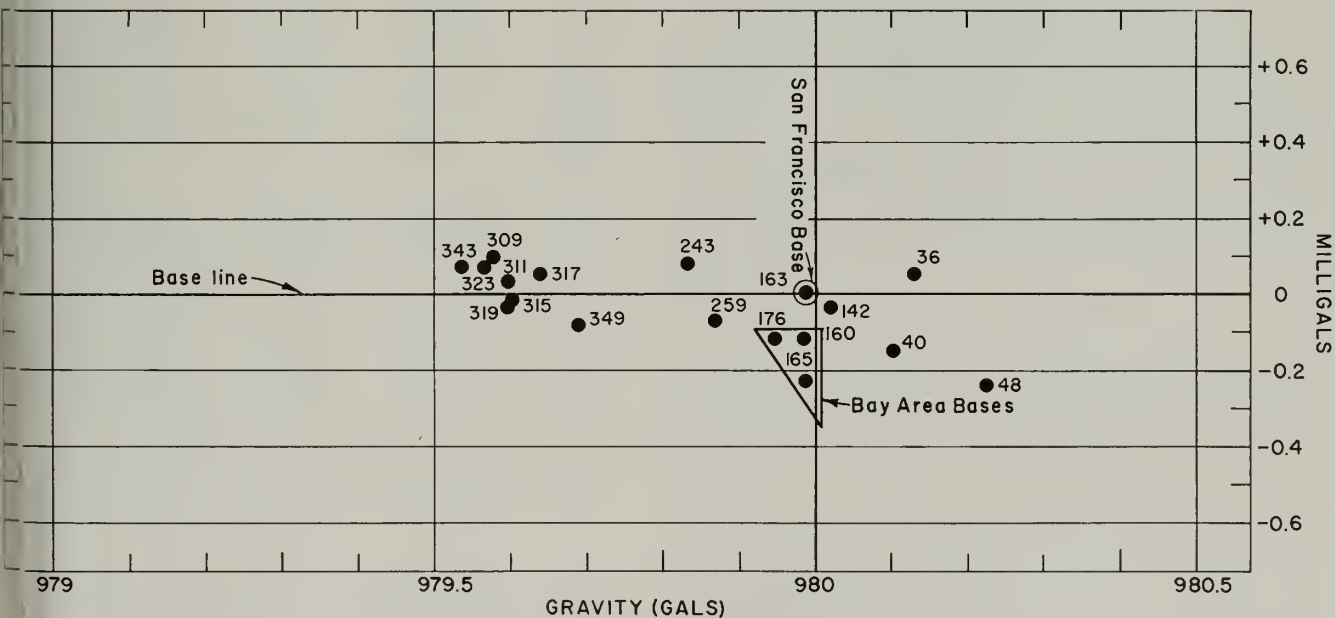


Figure 2. Comparison of California Division of Mines and Geology (G-22) gravity values (dots) with Woollard and Rose (1963) gravity values (base line).

observed gravity of 979.5978 gals at the UCLA station in room 1275, Geology-Chemistry building (station 311 in this report).

Because the Division of Mines and Geology value at this station is 0.12 milligal lower than the Harrison and Corbato figure, all CDMG values have been increased 0.12 milligal in Table 4, to make this station a common base and enable direct comparisons. Al-

Table 4. Comparison of the California Division of Mines and Geology and Harrison and Corbato gravity values.

Station number <sup>1</sup> and location	A CDMG <sup>2</sup> (gals)	B Harrison and Corbato (gals)	Difference (A - B) (milligals)
23 Susanville.....	979.81007	979.8101	-0.03
47 Eureka.....	980.22208	980.2220	+0.08
160 San Francisco.....	979.98673	979.9867	+0.03
226 Bishop.....	979.46236	979.4624	-0.04
232 Saline Valley.....	979.40548	979.4056	-0.12
260 San Lucas.....	979.79327	979.7932	+0.07
280 Inyokern.....	979.51983	979.5199	-0.07
300 Pomona.....	979.54991	979.5498	+0.11
311 Los Angeles.....	979.59780	979.5978	Assumed base
319 Los Angeles.....	979.59468	979.5946	+0.08
327 Riverside.....	979.53212	979.5321	+0.02
343 San Diego.....	979.53717	979.5370	+0.17
348 Medford, Oregon.....	980.23646	980.2364	+0.06

<sup>1</sup> For complete descriptions of stations, see Table 2 (appendix).  
<sup>2</sup> CDMG values were adjusted upward 0.12 milligal to a common datum.

though individual station differences range from +0.1 to -0.12 milligal, the mean difference with regard to sign for the 13 stations in Table 4 is +0.03 milligal. Without regard to sign the mean difference is 0.07 milligal in magnitude.

*U. S. Coast and Geodetic Survey pendulum stations.* Thirty-five of the U. S. Coast and Geodetic Survey pendulum stations in California (Duerkson, 1949) were reoccupied during this study. The original determinations were made between 1891 and 1939 by several different field parties, mostly in the years 1916 and 1939. The values of gravity at these stations are of interest because they have been used for regional gravity studies and have served as base stations for local surveys. The gravity intervals between some of these stations have also been used to calibrate gravity meters.

In the present survey an attempt was made to occupy the exact site of each pendulum observation although because of destruction of some of the buildings, this was not always possible. For stations where the exact site was not reoccupied, the CDMG value of observed gravity given in Table 5 and figure 3 were adjusted for differences in elevations. Although the earlier pendulum sites were unmarked, the 1939 pendulum sites are identified by standard gravity discs located in the immediate vicinity. When the 193

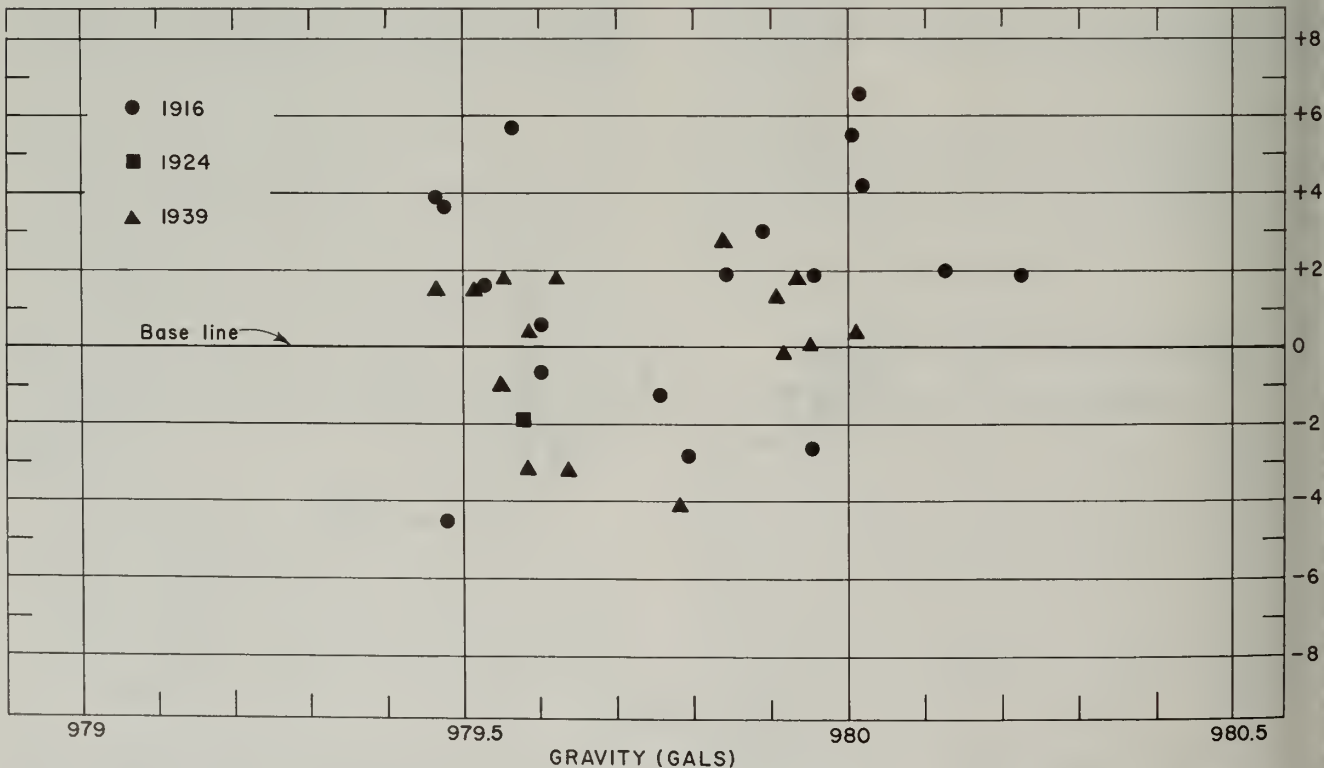


Figure 3. Comparison of U. S. Coast and Geodetic Survey pendulum values (all symbols) with California Division of Mines and Geology (G-22) gravity values (base line) adjusted to a common base.

tions were reoccupied, readings were taken beside the markers for convenience, rather than at the exact sites of the pendulum observations as described by the U. S. Coast and Geodetic Survey (Duerkson, 1949). Table 5 lists the comparative values at 35 stations. Figure 3 shows the difference in gravity values, plotted as a function of the change in gravity. Because the U. S. Coast and Geodetic Survey datum value for the Washington base is 0.8 milligal lower than that adopted by Woollard (Woollard and Rose, 1963, p. 139) the CDMG gravimeter values in Table 5 were increased 0.8 milligal to enable direct comparisons.

Table 5. Comparison of California Division of Mines and Geology gravimeter values and U.S. Coast and Geodetic Survey pendulum values at 35 stations.

Station number <sup>1</sup> and location	A CDMG <sup>2</sup> (gals)	B USC&GS <sup>3</sup> (gals)	Difference (B - A) (milligals)
1 Mt. Hamilton (US 55)	979.6484	979.663	+14.6
2 Tehama (US 235)	980.1230	980.125	+2.0
3 Sacramento (US 236)	980.0144	980.021	+6.6
4 Willits (US 237)	980.0045	980.010	+5.5
5 Eureka (US 238)	980.2211	980.223	+1.9
6 Santa Rosa (US 239)	980.0198	980.024	+4.2
7 San Diego (US 240)	979.5294	979.531	+1.6
8 Oceanside (US 241)	979.5653	979.571	+5.7
9 Highland (US 242)	979.4754	979.479	+3.6
10 Palmdale (US 247) <sup>4</sup>	979.4611	979.465	+3.9
11 Mojave (US 248)	979.4785	979.474	-4.5
12 Maricopa (US 249) <sup>4</sup>	979.6024	979.603	+0.6
13 Ventura (US 250)	979.5997	979.599	-0.7
14 Avila Beach (US 252)	979.7562	979.755	-1.2
15 San Lucas (US 253) <sup>4</sup>	979.7928	979.790	-2.8
16 Monterey (US 254) <sup>4</sup>	979.8895	979.893	+3.5
17 Hollister (US 255)	979.8381	979.840	+1.9
18 Palo Alto (US 256)	979.9551	979.957	+1.9
19 San Gregorio (US 257)	979.9556	979.953	-2.6
20 Pasadena (US 314)	979.5789	979.577	-1.9
21 Mecca (US 1019)	979.5502	979.552	+1.8
22 Pomona (US 1023) 1939	979.5490	979.548	-1.0
23 Newberry (US 1024)	979.5155	979.517	+1.5
24 Amboy (US 1025)	979.5865	979.587	+0.5
25 Needles (US 1026)	979.6211	979.623	+1.9
26 Independence (US 1030)	979.4635	979.465	+1.5
27 Vaukena (US 1031)	979.7811	979.777	-4.1
28 Fresno (US 1032)	979.8363	979.839	+2.7
29 Modesto (US 1033)	979.9302	979.932	+1.8
30 Sacramento, N. (US 1035)	980.0086	980.009	+0.4
31 Newcastle (US 1037)	979.9499	979.950	+0.1
32 Applegate (US 1038)	979.9141	979.914	-0.1
33 Colfax (US 1039)	979.9087	979.910	+1.3
34 Ruckee (US 1043)	979.5862	979.583	-3.2
35 Lystic (US 1044)	979.6332	979.630	-3.2

<sup>1</sup> Complete descriptions of the stations, see Table 2 (appendix).  
<sup>2</sup> CDMG gravimeter values adjusted downward 0.8 milligal to a common datum.  
<sup>3</sup> Pendulum values.  
<sup>4</sup> Adjustment made for elevation difference.

On the basis of numerous observations on U. S. Coast and Geodetic Survey pendulum stations in the United States, Woollard and Rose (1963, p. 130) observed that, although the pendulum values are char-

acterized by random errors of  $\pm 3$  milligals, there are strong indications of datum shifts associated with different series of observations. In general, however, the more recent pendulum observations are better. The number of these pendulum stations occupied in California during the present survey (over 60 percent) may not be sufficient to provide reliable conclusions, but the results are similar to those reported by Woollard. The observations made in 1916 (stations US 235 to US 257 occupied in the present survey) yield mean differences relative to the gravimeter measurements of about +1.7 milligals with regard to sign, and 3.0 milligals without regard to sign, as compared with Woollard's figures of +1.7 milligals and 2.4 milligals, respectively, on a national basis (Woollard, 1963, p. 139). Also the observations made in 1939 (stations US 1019 to US 1044 occupied in the present survey) show a mean difference of essentially zero, with regard to sign, and 1.7 milligals without regard to sign, compared with Woollard's differences of +0.4 milligal and 1.7 milligals respectively.

*Other gravity values.* A number of gravity stations established by the U. S. Geological Survey with LaCoste-Romberg geodetic meter G-17, chiefly in the southern Sierra Nevada area (H. W. Oliver, written communication, 1964), were also reoccupied. Although not tabulated in this report, agreement between Oliver's data, based on the U. S. Geological Survey base station at Menlo Park (station 173) and the Division of Mines and Geology data was within  $\pm 0.10$  milligal at almost all stations.

The results of two direct unclosed air ties between Moffett Field (station 178) and China Lake, using LaCoste-Romberg geodetic meter No. 22, were furnished by R. von Huene (written communication, 1964). Assuming the value given in Table 2 for Moffett Field, ties to Inyokern (station 280) from China Lake yield a value at Inyokern of 979.5197 gals, a figure which is the same as that in Table 2 for this station.

## CONCLUSIONS

This study has provided a network of gravity base stations in California which should serve to augment the values of gravity previously published by Woollard and Rose (1963) and Harrison and Corbato (1965). The reliability for most stations is believed to be about  $\pm 0.10$  milligal with reference to the calibration standard and base value used. Should it become desirable in the future to adjust either the value of gravity used as a base for this survey or the meter calibration, all stations can be adjusted without loss in the value of the network.

STATE OF OREGON  
348

INDEX TO  
CALIFORNIA DIVISION OF MINES AND GEOLOGY  
GRAVITY BASE STATIONS  
BY  
ARMY MAP SERVICE SHEETS

For location of Stations see Plate I

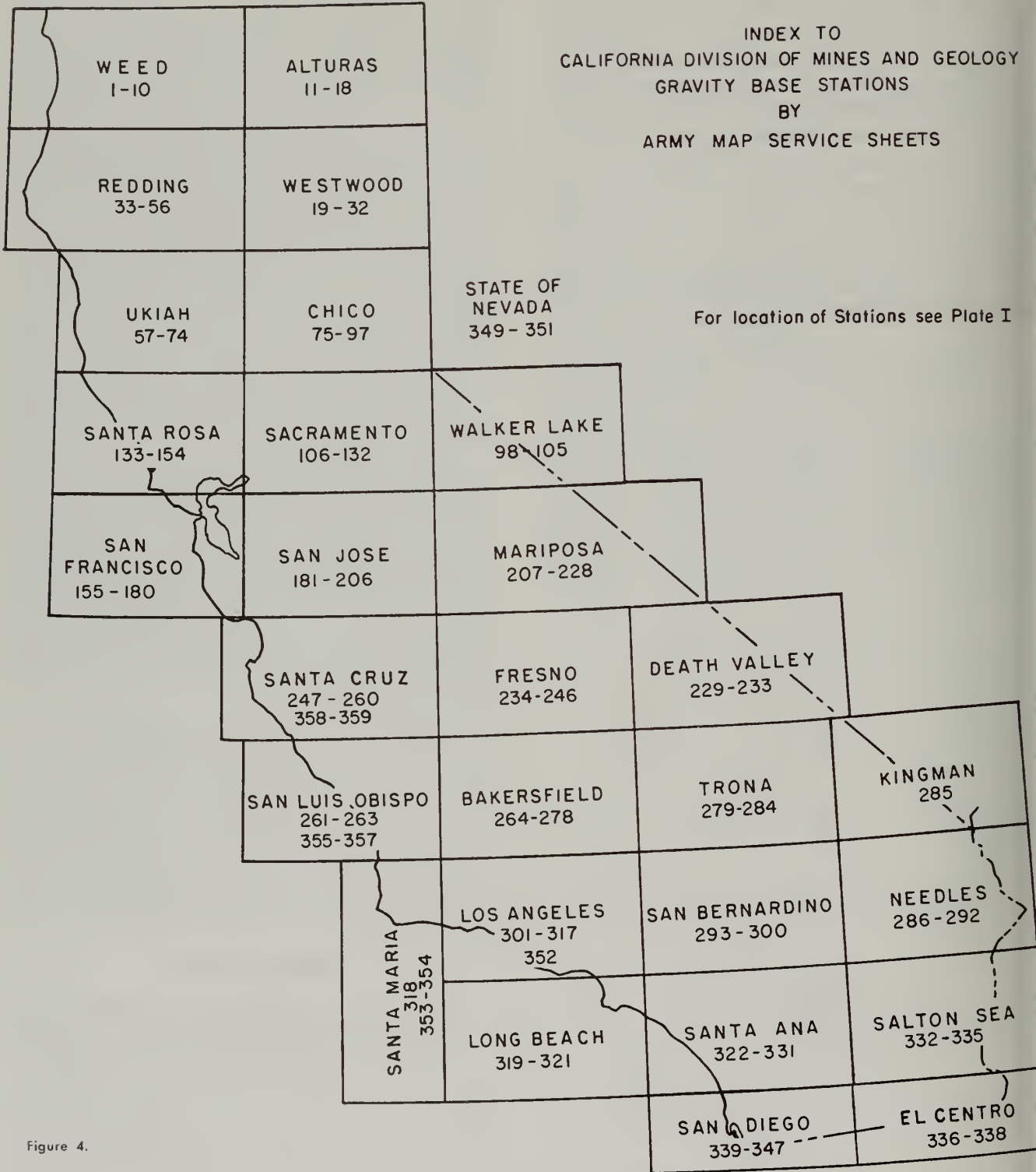


Figure 4.

It is hoped that the gravity base station network will prove to be useful to individuals and organizations concerned with gravity measurements in California, and that it will facilitate the compilation of data within the state.

### REFERENCES

- Shrendt, J. C., and Waallard, G. P., 1961. An evaluation of the gravity control network in North America: *Geophysics*, vol. 26, no. 1, pp. 57-76.
- Robinson, D. B., 1960. Introduction to geophysical prospecting, second edition: McGraw Hill Book Company, New York, pp. 169-262.
- Werkson, J. A., 1949. Pendulum gravity data in the United States: U. S. Dept. Commerce, Coast and Geodetic Survey, Spec. Pub. 244, 218 p.
- Harrison, J. C., and Corbata, C. E., 1965. The Mount Wilson calibration range, new geodetic measurements in the western United States and some submarine gravity measurements in the northeastern Pacific Ocean: *Trans. Amer. Geophys. Union*, vol. 46, no. 1, pp. 212-214.
- Rice, D. A., 1965. The gravity base network of the U. S. Coast and Geodetic Survey: *Trans. Amer. Geophys. Union*, vol. 46, no. 1, pp. 209-211.
- Service Hydrographique de la Marine and Campagne General de Geophysique, 1961, 2, 3, Tidal gravity corrections for 1962, 1963, and 1964: *Geophysical Prospecting*, supplement 1, vol. 9, 10, 11.
- Thompson, L. G. D., Hawkins, C. S., and Perry, R. M., 1962. A U.S.A.F. air base gravity network: Research report, Terrestrial Sciences Laboratory, Project 7600, Air Force Cambridge Research Laboratories, Office of Aerospace Research, United States Air Force, 17 p.
- Waallard, G. P., 1958. Results for a gravity control network at airports in the United States: *Geophysics*, vol. 23, no. 3, pp. 520-535.
- Waallard, G. P., and Rose, J. C., 1963. International gravity measurements: Published by the Society of Exploratory Geophysicists, Tulsa, Oklahoma, 518 p.





## APPENDIX

*Table 2—Gravity data and station descriptions.*

*Stations are grouped according to sheets of the Geologic Map of California, Olaf. P. Jenkins edition.*

*Bench mark numbers are given in the descriptions which follow for all stations which occupied or are referenced to one of these points.*

### Explanation of Symbols and Abbreviations

	Station occupied with Worden meter 558 (all other stations occupied with LaCoste-Romberg meter G-22).	CDH	California Division of Highways
		CLA	City of Los Angeles
JSC&GS	U. S. Coast and Geodetic Survey	DWR	California Department of Water Resources
JSGS	U. S. Geological Survey	US—	Pendulum station designation
JSDA	U. S. Department of Agriculture	Tri. Sta.	Triangulation station
JSBPR	U. S. Bureau of Public Roads	RM	Reference mark

## ALTURAS

Station	Observed gravity	Latitude	Longitude	Elevation	Simple Bouguer anomaly
11. Hackamore, USC&GS S-602.....	979.9081	41° 36.70'	121° 12.69'	4406.5'	-151.9
	On State Highway 139 approximately 28 miles northwest of Canby, opposite the state plant quarantine station office. Forty-eight feet northeast of the center line of the highway. Reading on ground 1.2' below disc.				
12. Canby, USC&GS T-136.....	979.8966	41° 26.65'	120° 52.04'	4312.1'	-154.0
	At Canby on State Highway 299, in the northeast corner of the yard of the highway maintenance station, 42 feet southeast of the center line of the highway. Reading on the disc.				
13. Alturas, Modoc Union High School USC&GS D-93 Reset 1938.....	979.8911	41° 29.55'	120° 32.48'	4370.9'	-160.3
	At Alturas at the high school on Main Street at the main (west) entrance. Set vertically in the wall near the steps. Reading on concrete sidewalk 2.05' below disc.				
14. Alturas-Modoc County Court House USC&GS F-93.....	979.8888	41° 29.02'	120° 32.38'	4364.3'	-162.2
	At Alturas at the Modoc County Court House, at the main entrance in the west face of the north balustrade. Reading on second step above ground level, 1.75' below disc.				
15. Cedarville, USC&GS X-158.....	979.8736	41° 31.78'	120° 10.05'	4629.2'	-165.6
	At the eastern edge of Cedarville on the south side of the highway leading to Vya, Nevada (State Highway 299), 0.2 mile east of Main Street and 30' south of the center line of the highway. Reading taken on ground 0.7' below disc.				
16. Likely, USC&GS R-93.....	979.8578	41° 13.77'	120° 29.99'	4443.7'	-165.7
	At Likely on the Southern Pacific Company railroad, in the top of the northwest corner of the center foundation of the water tower. Reading on the disc.				
17. Fall River Mills, USC&GS F-135..	979.9299	41° 00.24'	121° 26.25'	3315.7'	-141.1
	At Fall River Mills at the I.O.O.F. building in the northeast corner of the concrete porch, 6" south of the north edge of the porch, and 3" west of the building. Reading on the disc.				
18. Bieber High School, USC&GS U-135.....	979.8718	41° 07.31'	121° 08.41'	4131.9'	-160.7
	At Bieber at the Bieber High School in the top of the north concrete bannister of the steps for the west (main) entrance, 2.6' west of the west wall of the building and 0.9' south of the north edge of the bannister. Reading on the disc.				
<b>BAKERSFIELD</b>					
264. Pixley R.R. Station USC&GS R-455.....	979.7574	35° 58.06'	119° 17.54'	266.4'	-54.6
	At Pixley along the Southern Pacific Railroad tracks, 3' east of the northeast corner of the station, 62' east of the east rail of the main track, one foot west of the west edge of a sidewalk. Reading on the disc.				
265. Delano Library USC&GS W-88....	979.7525	35° 46.27'	119° 14.60'	314.8'	-39.9
	At the main entrance of the Kern County Free Library in Delano, at the northeast corner of the intersection of Eleventh Avenue and Jefferson Street in the top of the west end of the second concrete step. Reading on the disc.				
266. Famoso USC&GS F-89.....	979.7326	35° 35.85'	119° 12.38'	421.2'	-38.5
	At Famoso along the Southern Pacific Railroad tracks, 216' south of the southeast corner of the station in line with a row of telegraph poles, 115' east of the east rail of the main track. Reading taken on disc.				
267. Blackwells Corner USGS R-11.....	979.6750	35° 36.92'	119° 52.01'	643.2'	-84.3
	At Blackwells Corner at the intersection of State Highway 46 and State Highway 33. 50' north of the center line of 46 and 29' southwest of the center line of 33. Reading on ground 0.3' below disc.				

## BAKERSFIELD—Continued

Station	Observed gravity	Latitude	Longitude	Elevation	Simple Bouguer anomaly
68. McKittrick USC&GS F-67-----	979.6243	35° 18.35'	119° 37.32'	1050.9'	-84.2
	At McKittrick 200' west along the Southern Pacific Railroad tracks from the railroad station, at the crossing of State Highway 33 (Second Street), 49' southwest of the southwest rail of the main track and 28.5' northwest of the center of the highway. Reading on the disc.				
69. Taft, USC&GS "Taft"-----	979.6124	35° 08.47'	119° 27.50'	983.04'	-86.2
	At Taft, at the southwest corner of the intersection of Center and Fifth Streets, set in the north brick wall of the Bank of America Building, 1.7' west of the east corner. Reading on sidewalk 3.25' below disc.				
70. Maricopa Pendulum Station, US-249 (Outside Site)-----	979.6027	35° 03.52'	119° 23.93'	848.4'	-96.9
	At Maricopa on State Highway 33 at the old Bank of Maricopa building, now Maricopa Locker Plant, on Main Street opposite the end of Horn Street, at the northeast corner of the building. Reading on sidewalk just north of the wall.				
71. Oildale, USGS B01931, Reset 1941	979.7075	35° 25.03'	119° 01.20'	455'	-46.2
	In Oildale on the east side of North Chester Avenue in front of the Standard School Auditorium in the concrete entrance to an underpass. Reading taken on disc.				
72. Bakersfield Post Office, USC&GS F-55-----	979.7049	35° 22.53'	119° 01.27'	401.0'	-48.5
	At the Post Office in Bakersfield at the northeast corner of the intersection of 18th and G Streets, in the south wall, 4.2' west of the southeast corner. Reading taken on the ground 2.9' below disc.				
73. Magunden, USGS 431-----	979.6942	35° 21.93'	118° 56.51'	429.3'	-56.6
	On the north side of State Highway 58 approximately 0.1 mile west of the intersection of Sterling Road, 46.2' south of the south rail and 34.7' north of the center line of the highway, 40.5' east of a power line pole. Reading on ground 1.0' below disc.				
74. Mettler Fire Station, USC&GS W-365-----	979.6221	35° 03.85'	118° 58.19'	537.9'	-96.6
	At Mettler along U.S. Highway 99, 0.3 mile north of the "T" junction of State Highway 166, at the northwest corner of Kern County Fire Department-Mettler sub-station. Reading on the disc.				
75. Tehachapi, USC&GS E-56-----	979.4264	35° 07.89'	118° 26.31'	3973.2'	-91.9
	At Tehachapi, about 150 yards east along the Southern Pacific-Santa Fe Railroad from the station, 96' south of the south rail and 26' north of the north curb of State Highway 58. Reading on disc.				
76. Mojave Tri. Station, USC&GS "Mojave 1958"-----	979.4730	35° 04.27'	118° 10.29'	2845.9'	-107.8
	Station is located on the northwest side of State Highway 14, 0.4 of a mile northeast of the junction with State Highway 58, about one mile north of Mojave. Reading taken on ground beside disc.				
7. Mojave Pendulum Station, US-248	979.4794	35° 03.14'	118° 10.37'	2750.0'	-105.6
	At Mojave at the northeast corner of the junction of Sierra Highway (State Highway 14) and Inyo Street, across the highway from the north end of the railroad station in the small basement of an old store (now a radio store) at this location. Approximate location of pendulum station.				
8. Mojave Pendulum Station, US-248 (Outside Site)-----	979.4789	35° 03.14'	118° 10.37'		
	At Mojave at the northeast corner of the junction of State Highway 14 and Inyo Street, across the highway from the northeast end of the railroad station. Reading taken on the sidewalk at the corner by the corner post of an old store building, on the store side of the post.				
<b>CHICO</b>					
5. Chico Airport, USC&GS B-743---	980.1312	39° 47.94'	121° 51.21'	239.5'	-17.0
	At Chico Municipal Airport, about 300' north of the Pacific Airlines passenger terminal at the end of a road leading to the former location of the control tower. Reading taken 0.2' below disc on ground.				

## CHICO—Continued

Station	Observed gravity	Latitude	Longitude	Elevation	Simple Bouguer anomaly
76. Chico Post Office, USC&GS Q-17	980.1418	39° 43.68'	121° 50.25'	195.8'	-2.8
	At Chico at the Post Office on the southeast corner of 5th and Broadway Streets, just east of the main entrance on the balustrade about 3.7 feet above the ground. Reading on ground level 3.7' below disc.				
77. Chico-Ranchero Airport, USC&GS S-848	980.1478	39° 43.32'	121° 52.35'	168.9'	+2.1
	At Chico Ranchero Airport at the northeast corner of hanger No. 2. Reading taken on ground 0.4' below disc.				
78. Pulga, USC&GS W-872	979.9659	39° 47.69'	121° 27.10'	1529.6'	-104.6
	About 0.6 mile south of Pulga on State Highway 70, at the west end of a bridge over the Feather River, located in Section 6, T. 22 N., R. 5 E., on the north side of the bridge abutment, about 18' northwest of the center line of the highway. Reading taken on disc.				
79. Feather River, USC&GS S-863	979.9427	39° 45.70'	121° 28.47'	2054.5'	-93.4
	3.4 miles southwest along State Highway 70 from the bridge over the Feather River located in Section 6, T. 22 N., R. 5 E., in the top of the east end of the north concrete headwall of Highway Culvert No. 126 + 71.55, 22 feet north of the center line of the highway. Reading on ground 0.4' below disc.				
80. Oroville, East, USC&GS X-145	980.0736	39° 31.04'	121° 31.56'	384.3'	-41.1
	At an overhead road crossing 1.8 mile northeast of Oroville on the old Feather River Highway (old U.S. Highway 40 alternate). Reading on road 4.0' below disc.				
81. Oroville-Butte Co. Court House, USGS 173-B	980.0879	39° 30.73'	121° 33.30'	169.6'	-39.2
	At Oroville at the northeast corner of the County Jail. Reading on concrete driveway 4.2' below disc.				
82. Marysville Library, USC&GS R-114	980.0422	39° 08.40'	121° 35.19'	61.4'	-58.4
	At Marysville at the City Library at the northwest corner of intersection of C and 4th Streets. Reading on sidewalk 0.5' below disc which is in the east foundation wall.				
83. Yuba City-Hall of Records, USC&GS P-114	980.0431	39° 08.17'	121° 36.32'	59.8'	-57.2
	At Yuba City at the Hall of Records at Second and B Streets, at the east entrance in the face of the foundation. Reading on sidewalk 1.9' below disc.				
84. Quincy, County High School, USC&GS D-144	979.8192	39° 56.32'	120° 56.12'	3420.4'	-150.6
	At Plumas County High School in Quincy, 28' southwest of the south entrance on a rock outcropping. Reading 2.0' below disc.				
85. Quincy-Plumas Co. Court House, USC&GS E-144	979.8176	39° 56.19'	120° 56.80'	3432.3'	-151.3
	At Quincy at the Plumas County Court House, at the main (north) entrance, in the top of the east end of the second step from the bottom. Reading on the disc.				
86. Graeagle, Roe Park	979.7523	39° 46.25'	120° 37.09'	4375'	-145.5
	At the town of Graeagle in Herb Roe Park. Reading taken on the concrete base of the flag pole.				
87. Calpine, USGS H-122	979.6918	39° 40.00'	120° 26.25'	4956.0'	-161.8
	At Calpine in the concrete foundation of a store building, just northeast of the southeast corner of the building. Building is located on the east side of town on the southwest side of the road which enters Calpine from State Highway 89. Reading taken on ground 2.0' below disc.				

## CHICO—Continued

Station	Observed gravity	Latitude	Longitude	Elevation	Simple Bouguer anomaly
88. Sierraville, USC&GS N-193-----	979.6769	39° 35.41'	120° 22.06'	4952	-170.0
	At the northwest edge of Sierraville on State Highway 89 and 49, 27' north of the center line of the highway, 36' west of a utility pole and about 580 yards west of the corner of a store. Reading taken at ground level about 5' south of and slightly below the disc.				
89. Sierraville School, USGS H-129---	979.6755	39° 35.03'	120° 22.06'	4974	-169.6
	At Sierraville on south concrete banister at the east entrance to the Sierraville School. Reading on the disc, 2.2' above the ground.				
90. Mystic Pendulum Station, US-1044-----	979.6341	39° 27.1'	120° 0.4'	5150.4'	-188.8
	On the east side of Interstate Highway 80, approximately 11 miles west of Reno, Nevada, and 0.4 miles north along highway from Nevada County-Sierra County Line, about 235' east of the highway. A standard gravity disc stamped "Mystic 1939". Reading at ground level 0.5' below disc.				
91. Truckee Pendulum Station, US-1043-----	979.5870	39° 19.54'	120° 12.37'	5889.3'	-180.3
	Near east side of large triangle formed by junction of old US Highway 40 and State Highway 89, one mile west of Truckee, a standard gravity disc stamped "Truckee 1939". Reading at ground level 0.5' below disc.				
92. Soda Springs, USBPR 288-65.7---	979.5565	39° 19.43'	120° 22.75'	6767.3'	-158.0
	On the north side of old US Highway 40 across the road from the Soda Springs Hotel, about 54' west of a private driveway, and 38' north of the center line of the highway. Reading at ground level slightly below disc.				
93. Blue Canyon Airport, USDA "Blue Canyon"-----	979.6821	39° 16.58'	120° 42.48'	5276.7'	-117.7
	At the Blue Canyon Airport, set on top and in the center of a large concrete base supporting the airway beacon. Reading on the disc.				
94. Nevada City, USGS H-128-----	979.9018	39° 15.37'	121° 01.39'	2592.4'	-57.3
	At Nevada City at the Seven Hills Intermediate School, at the north entrance to the building on the bottom concrete step. Reading on the disc.				
95. Grass Valley Post Office, USC&GS "Grass Valley 1934"-----	979.9183	39° 13.12'	121° 03.65'	2410.0'	-48.3
	At Grass Valley at the Post Office 29½' north of the main entrance. Reading taken 1.4' below disc at ground level on a steel plate.				
96. Colfax Pendulum Station, US-1039	979.9095	39° 08.04'	120° 56.42'	2150.6'	-65.2
	Station is located about 2.5 miles northeasterly along old US Highway 40 from the town of Colfax on the east side of the road. The mark is 440', S 20° E from the center of the intersection of the highway and an old railroad crossing which formerly passed over the highway on a trestle. A standard gravity disc stamped "Colfax 1939". Reading on ground 0.6' below disc.				
97. Tahoe City Tavern, USC&GS H-174-----	979.5425	39° 09.64'	120° 08.48'	6265.4'	-187.8
	At Tahoe Tavern, on the west shore of Lake Tahoe, 94' east of the east face of the building and 31.5' north of the center line of an asphalt walkway leading to a pier. Reading on the disc, which is flush with the ground.				
<b>DEATH VALLEY</b>					
98. Stovepipe Wells USC&GS, "Holde 1949" Triangulation Station---	979.7661	36° 38.28'	117° 01.60'	-150.4'	-110.6
	In Death Valley about 8 miles east of Stovepipe Wells Hotel along State Highway 190 on the north-east side of the road, 0.3 mile southeast of the junction with the road leading northwest to Scotty's Castle. Reading taken on ground, 0.6' below disc.				

## DEATH VALLEY—Continued

Station	Observed gravity	Latitude	Longitude	Elevation	Simple Bouguer anomaly
230. Furnace Creek Ranch, USGS "—178"-----	979.7636	36° 27.43'	116° 51.99'	-179.8'	-117.3
At Furnace Creek Ranch 166 yards west of the filling station, 230 yards west of the center line of State Highway 190, 6' south of a fence, in line with a row of trees directly behind the filling station. Reading on ground 0.5' below disc.					
231. Panamint Valley, USGS 13-D----	979.6310	36° 20.39'	117° 25.39'	1575.6'	-134.5
About 2½ miles east of Panamint Springs in Panamint Valley on State Highway 190 on the north side of the highway just west of the junction with a dirt road leading southeast. Reading taken on ground 0.5' below disc.					
232. Saline Valley, USGS 4880-----	979.4054	36° 19.88'	117° 42.78'	4878.4'	-161.2
2.4 miles northwest along State Highway 190 from the junction of the road to Darwin at the junction of a road leading to Saline Valley, 435' north of Highway 190 and 37' east of Saline Valley Road in the top of a black volcanic rock. Reading on the disc.					
233. Coso Junction-----	979.4488	36° 02.70'	117° 56.80'	3381'	-183.0
About 4 miles north of Little Lake on US Highway 395, at the base of a telephone pole marked "9205" which is on the east side of the highway just south of a junction with a paved road marked "Gill Sta. Coso Rd." leading east to Coso Hot Springs and west to Sykes. The pole is about 16 yards east of the center line of the highway and 15 yards south of the center line of the Coso Hot Springs Road.					
<b>EL CENTRO</b>					
336. Brawley, Union High School, USC&GS K-611-----	979.5515	32° 58.98'	115° 32.03'	-113.7'	-32.4
At the Union High School in Brawley at the intersection of Imperial and B Streets, located on the northwest corner of the middle of three school buildings in the top of a concrete projection. Reading on sidewalk 3.5' below and just north of the disc.					
337. El Centro West-----	979.5189	32° 48.00'	115° 34.67'	39'	-45.4
0.5 mile west of State Highway 86 in El Centro, one block north of Interstate Highway 8. Station located on the west side of the road, 10' east of the second pole south of the railroad tracks. Metal tag stamped 896 nailed to pole. Reading on west shoulder of road.					
338. El Centro—Imperial Co. Court House, USC&GS R-59-----	979.5198	32° 47.55'	115° 33.78'	-43.1'	-44.3
At El Centro on the south side of Main Street between 9th and 11th Streets in the north face of the northwest corner of the Imperial County Court House, about 3' east of the corner. Reading on walk 3.1' below disc.					
<b>FRESNO</b>					
234. Independence, Inyo County Court House, USGS "3926"-----	979.4609	36° 48.23'	118° 11.91'	3921.2'	-203.9
At the Inyo County Court House in Independence, at the front (west) entrance. Reading taken on the steps, 2.0' below USGS disc marked "3926, 1905", on the 5th step at the south end of the entrance.					
235. Independence Pendulum Station, US-1030-----	979.4644	36° 46.63'	118° 10.72'	3954.7'	-196.1
A standard gravity mark located 2.25 miles south of the Court House at Independence along US Highway 395, on the northeast side of the highway, about 386' N. 45° E. from the center line of the highway. Reading taken 0.4' below disc on ground.					
236. Lone Pine High School, USC&GS D-44, Reset 1941-----	979.4552	36° 36.12'	118° 03.59'	3726.0'	-203.8
At the Lone Pine High School on the east side of US Highway 395 at the east end of the first step to the auditorium. Reading on the disc.					

## FRESNO—Continued

Station	Observed gravity	Latitude	Longitude	Elevation	Simple Bouguer anomaly
37. Olancha, USGS "3649"-----	979.4200	36° 16.95'	118° 0.37'	3646.7'	-216.2
	At Olancha on the west side of US Highway 395, about 210' northwest of the intersection of the highway and the Darwin Road, 2' north of the concrete step to the front porch of a house. Reading on ground 0.75' below disc.				
38. Visalia Junior High School, USC&GS P-827-----	979.7985	36° 19.81'	119° 18.08'	330.8'	-40.8
	At Visalia Junior High School on West Main Street near the junction of Turner Street, at the north entrance on the west balustrade, 5.5' above the ground. Reading on the disc.				
39. Tulare City Hall, USC&GS Z-87, Reset 1940-----	979.7870	36° 12.43'	119° 20.53'	284.6'	-44.5
	At the City Hall in Tulare, southeast of the intersection of East Kern and South M Streets, at the base of a flag pole at the northwest corner of the lawn. Reading taken on brick walk at ground level, just west of and 1.0' below disc which is set in the raised flag pole base.				
40. Waukena Pendulum Station, US-1031-----	979.7819	36° 09.57'	119° 30.49'	228.9'	-48.8
	1.5 miles north of Waukena, approximately 584 feet east of the center line of Shamrock Avenue along the extension of a fence line which marks the east-west center line of Section 29, T.20 S., R.23 E., about 5' north of a farm road on the edge of a shallow irrigation ditch. Approximate position of pendulum station but no markers were found in the area.				
41. Hanford, Kings Co. Court House, USGS 250.465-----	979.8122	36° 19.68'	119° 38.76'	245.0'	-32.0
	At the Kings County Court House in Hanford at West 8th and North Irwin Streets. Reading taken at the south entrance on the sidewalk 2.65' below USGS BM stamped 250.465 on the east balustrade.				
42. Kingsburg, USC&GS K-670-----	979.8319	36° 31.08'	119° 32.55'	298.5'	-25.5
	At Kingsburg, by the southeast corner of the Kingsburg High School athletic field, 27' north of the center line of the road, 9' west of a fence corner. Reading 0.4' below disc on ground.				
43. Old Fresno Airport (Woollard Airport Base WA-5)-----	979.8329	36° 46.45'	119° 42.23'	331'	-44.7
	At the old Fresno Airport at the building now designated No. 5544. Reading at the barrier between field and old terminal building on ground at sign reading "Gate 2 Restricted Area".				
44. New Fresno Airport, Gate 2-----	979.8325	36° 46.23'	119° 43.12'	323'	-45.2
	At the new (1963) Fresno Airport at gate 2, just inside the door leading to the field on the concrete floor.				
45. Fresno Pendulum Station, US-1032-----	979.8371	36° 46.52'	119° 50.20'	301.8'	-42.4
	About 3 miles northwest along US Highway 99 from Fresno, thence approximately 0.2 mile east along Clinton Avenue and 0.3 mile northwest along Weber Highway from its junction with Clinton Avenue, on southwest side of the street. A standard pendulum mark stamped "Fresno 1939". Reading 0.5' below the disc on ground.				
46. Fresno—Chandler Field, USC&GS Z-677-----	979.8345	36° 43.76'	119° 48.98'	276.8'	-42.5
	At Fresno at Chandler Field under the beacon tower at the southeast entrance to the field from Madison Boulevard, 40' northeast of the northeast corner of a small concrete building. Reading taken on the disc.				
KINGMAN					
85. Nipton East—State Line-----	979.4263	35° 28.54'	115° 13.48'	3616.4'	-142.7
	At Nevada-California State Line approximately 2 miles northeast of Nipton on Nevada State Highway 68. On top of Nevada Highway Dept. copper disc about 160' north of highway, across highway and 50' west of sign "Welcome to Nevada". Marking on disc "A.0 + 00.00 PC".				

## LONG BEACH

Station	Observed gravity	Latitude	Longitude	Elevation	Simple Bouguer anomaly
319. Old Los Angeles Airport (Woollard Airport Base WA-83)-----	979.5946	33° 56.61'	118° 22.98'	94'	-56.5
					At the former United Airlines Terminal Building (now Building No. 5820) at the old Los Angeles International Airport, inside the street exit to the lobby, west of the door.
320. Los Angeles Airport Theme Building-----	979.5968	33° 56.68'	118° 24.12'	105'	-53.7
					At the Los Angeles International Airport, on the sidewalk just north of the base of the north supporting leg of the Theme Building.
321. Long Beach City Hall-----	979.6189	33° 46.17'	118° 11.59'	31'	-21.4
					At Long Beach City Hall on the east side of the concrete base of a flag pole at the southwest corner of the building, at ground level.

## LOS ANGELES

301. Rosamond, USC&GS R-56-----	979.4829	34° 56.28'	118° 08.89'	2562.2'	-103.7
					On State Highway 14, 8 miles south of Mojave, 44' east of the center line of the highway, west of the railroad, 30' north of Sopp Road. Reading on disc.
302. Gorman, USC&GS B-54-----	979.4173	34° 47.79'	118° 51.08'	3810.5'	-82.5
					On the sidewalk on the northeast side of the road in front of the Greyhound Bus Station at Gorman on the front edge of the building. Reading on disc.
303. Lancaster, USGS RR 37-----	979.4798	34° 42.25'	118° 09.90'	2324.5'	-101.3
					About one mile west of Lancaster, on the north side of Avenue I at the intersection of Sections 8, 9, 16, and 17, T.7 N., R.12 W., north of the road. Reading on ground 0.4' below disc.
304. Palmdale R.R. Station, USGS 2657-----	979.4616	34° 34.76'	118° 06.97'	2658.1'	-89.0
					At Palmdale, 98' north of the northeast corner of the Southern Pacific Company Railroad Station, 70' east of the east rail of the main track, on a three inch iron pipe. Reading taken on ground 0.4' below disc.
305. Palmdale Pendulum Station, US-247 (outside site)-----	979.4616	34° 34.73'	118° 06.90'	2650.9'	-89.4
					At Palmdale at the southeast corner of a building located on the northeast corner of Atlantic and Main Streets on the sidewalk approximately above pendulum station which is in the basement.
306. Castaic, USC&GS X-370-----	979.5433	34° 30.32'	118° 36.90'	1230.1'	-86.7
					At junction of the old Ridge Route Highway and Elizabeth Lake Canyon Road about 1¼ miles north of Castaic, about 30' east of the center line of the highway and 50' southeast of the center line of the road. Reading on the disc.
307. San Fernando City Hall, USC&GS M-898-----	979.5300	34° 17.04'	118° 26.30'	1078.9'	-90.5
					At the San Fernando City Hall located at the T junction of First and Macneil Streets in the southeast face of the brick pillar at an offset in the wall, 118' northeast of the northeast curb of First Street and 27' northwest of the northwest curb of Macneil Street. Reading on ground 1.3' below and 3' southwest of the disc.
308. Pasadena Pendulum Station, US-314-----	979.5798	34° 08.17'	118° 07.46'	750.0'	-48.1
					At the California Institute of Technology in Pasadena at the Norman Bridge Laboratory of Physics on a special pier near the center of sub-basement room 02, the top of the pier being about 3.0' above floor level and 10' below the outside ground level.



## LOS ANGELES—Continued

Station	Observed gravity	Latitude	Longitude	Elevation	Simple Bouguer anomaly
09. Pasadena, California Institute of Technology (Woollard Station WU-4)-----	979.5784	34° 08.17'	118° 07.59'	765'	-48.5
At the California Institute of Technology, at the southwest corner of Mudd Hall, at the top of the stairs, on the landing at the entrance to the building (about 10' above ground level).					
10. Los Angeles State Building-----	979.5823	34° 03.20'	118° 14.71'		
At the State Building in Los Angeles at 102 South Broadway, ground floor, in hall outside door No. 1069.					
11. Los Angeles University of California at Los Angeles (Woollard Station WU-2)-----	979.5977	34° 04.17'	118° 26.43'	435'	-43.4
At U.C.L.A., at the Chemistry-Geology Building, at center of doors to room 1275.					
12. Port Hueneme City Hall, USC&GS Tidal 3-----	979.6430	34° 08.88'	119° 11.87'	9.2'	-30.3
At the City Hall in Port Hueneme at the corner of South Market and East Broad Streets in the south concrete wall of the building, 0.6' east of the southwest corner. Reading taken on sidewalk 1.9' below disc.					
13. Oxnard, USC&GS B-31-----	979.6249	34° 11.92'	119° 10.80'	50.1'	-50.2
At the Chamber of Commerce Building in Oxnard, which is on the east side of North 5th Street at the junction with South C Street, at the west entrance in the top of the north end of the concrete step between the sidewalk and the lower concrete landing. Reading taken on the disc.					
14. Ventura Pendulum Station, US-250-----	979.6005	34° 16.96'	119° 17.50'	78.1'	-79.9
At the Court House in Ventura on Poli Street, north of the end of California Street, in the northeast corner of the basement. Approximate location of pendulum station.					
15. Ventura Co. Court House (Woollard Station)-----	979.6000	34° 16.96'	119° 17.50'		
At the Court House in Ventura on Poli Street north of the end of California Street, in the northeast corner of the building, on the landing at the top of the steps to the basement.					
16. Santa Barbara R.R. Station, USC&GS N-28-----	979.6418	34° 24.84'	119° 41.48'	13.5'	-53.5
At the Southern Pacific Railroad Station at Santa Barbara. Reading taken on sidewalk about 0.2' below and 5' southeast of disc which is located in the south corner of a small park, 62' northeast of the east corner of the station, 46' northwest of the northwest rail of the main track.					
17. Goleta, Santa Barbara Airport (Woollard Airport Base WA-88)	979.6408	34° 25.56'	119° 50.12'	14'	-55.5
At Santa Barbara Airport, at street curb in front of right hand arch of terminal facing terminal.					
52.* Los Angeles City Hall, C.L.A. No. 4 (City of Los Angeles)---	979.5830	34° 03.20'	118° 14.51'	286.7'	-65.7
At Los Angeles, at the Main Street entrance to the City Hall, in the top of the north end of the bottom granite step, 14' west of the west curb of Main Street and about 1/2' higher than the street. Reading on the disc.					

## MARIPOSA

07. Mariposa Co. Court House, USGS BM 2022-----	979.7535	37° 29.36'	119° 57.99'	2015.8'	-85.0
At Mariposa County Court House in Mariposa on the west wall at the north end of the building. Station on ground 4.0' below disc.					

## MARIPOSA—Continued

Station	Observed gravity	Latitude	Longitude	Elevation	Simple Bouguer anomaly
208. Briceburg-----	979.7890	37° 36.29'	119° 57.91'	1177'	-110.0
	At Briceburg at the Briceburg Inn which is on the southwest corner of T junction of State Highway 140 with a dirt road leading to a bridge across the Merced River, on the lower porch in front of the building on the cobblestone surface, 1' north of the telephone booth and 1' east of a 2½' stone wall which separates the upper and lower porches.				
209. El Portal, USGS GR-1-----	979.7001	37° 40.50'	119° 46.91'	1916.4'	-160.6
	At El Portal at the coffee shop on the north side of Highway 140, just west of a service station, on the concrete porch, under the roof against the rock wall, between two large windows. Station is marked by a 3" brass plate stamped USGS GR-1, glued to the concrete surface.				
210. El Portal, USDA 1917.7-----	979.7001	37° 40.50'	119° 46.88'	1916.9'	-160.6
	At El Portal on the north side of the street across from the Post Office, 8' west of a red fire plug. Station on ground 0.8' below disc.				
211. Tioga Junction Dam, USC&GS G-235-----	979.5553	37° 43.15'	119° 40.89'	3816.4'	-195.3
	In Yosemite Park 5.3 miles west from New Village at the junction with Tioga Pass Road, in the top of the north end of a concrete dam 90' south of the center line of the highway. Station is on the mark.				
212. Bridal Veil Falls-----	979.5445	37° 43.00'	119° 39.02'	3915'	-199.9
	At Bridal Veil Falls parking area in Yosemite Park, at the far end of the parking area where foot path leaves for Bridal Veil Falls. Reading taken on asphalt surface on the parking lot side of a 4 x 3 x 2' boulder located in the center of the path.				
213. Chinquapin, USGS 34B-----	979.4563	37° 39.11'	119° 42.19'	6039.9'	-155.0
	At Chinquapin in Yosemite Park on the top of the first step of the front steps of the ranger station (residence 5000), which is about 65' west of the center line of the Yosemite-Fresno Highway. Reading on the disc.				
214. Badger Pass, USGS GR 6-----	979.3817	37° 39.77'	119° 39.78'	7220'	-159.7
	At Badger Ski Lodge in Yosemite Park at the main entrance to covered passageway from parking lot, on a 3" brass square stamped USGS GR 6 glued to concrete on the northwest corner of the entrance platform, about 17" higher than the adjacent road level.				
215. Sentinel Dome, USC&GS RM No. 2-----	979.2820	37° 43.39'	119° 35.00'	8123'	-210.5
	Summit of Sentinel Dome in Yosemite Park on U.S.C.G.S. RM. No. 2 which is about 16' east from and about 6" higher than VABM 8117.				
216. Tenaya Lake, USBPR 8162.1-----	979.2810	37° 50.30'	119° 27.10'	8161.6'	-219.3
	On the north side of Tioga Pass Road (State Highway 120) across the road from the picnic parking area at Tenaya Lake. Reading on ground 0.5' below disc.				
217. Smokey Jack Camp, USDA 466 + 5814-----	979.3884	37° 49.15'	119° 42.80'	7140'	-171.9
	0.1 mile northwest of the entrance to the Smokey Jack Camp on the north side of Tioga Pass Road (State Highway 120). Reading on ground 0.5' below disc which is marked 466 + 5814.				
218. Tuolumne Meadows, USC&GS N-592-----	979.2527	37° 52.54'	119° 21.30'	8591.1'	-225.1
	At Tuolumne Meadows on the north side of Tioga Pass Road (State Highway 120) across from a Yosemite National Park information station, and 275' southwest of a concrete bridge over Tuolumne River. On a granite outcrop. Station is on the disc.				
219. Tioga Pass, USBPR 9935.84-----	979.1800	37° 54.66'	119° 15.40'	9938.2'	-220.0
	At Tioga Pass at the east entrance to Yosemite Park, south of the ranger station on the east side of State Highway 120. Station on ground 0.5' below disc.				

## MARIPOSA—Continued

Station	Observed gravity	Latitude	Longitude	Elevation	Simple Bouguer anomaly
220. Tioga Pass, USDA 9945.4-----	979.1796	37° 54.69'	119° 15.44'	9947.9'	-219.9
	At Tioga Pass at the east entrance to Yosemite Park, north of the ranger station on the west side of State Highway 120. Station on ground 0.5' below disc.				
221. Lake Elery, USC&GS Z-272-----	979.2067	37° 56.27'	119° 14.10'	9521.9'	-220.6
	3.0 miles north of Tioga Pass ranger station on the north side of State Highway 120, across from a California Electric Power Company building on Elery Lake. Station is on ground 0.5' below disc.				
222. Mono Lake, USC&GS U-916-----	979.3822	37° 59.48'	119° 08.48'	6456.4'	-233.7
	At Mono Lake at the northwest side of Tioga Lodge across US Highway 395 from Post Office in top concrete step. Station is on the disc.				
223. Lee Vining, USC&GS S-123-----	979.3625	37° 57.48'	119° 07.14'	6789.8'	-230.5
	At Lee Vining in the center of the business district on the northeast side of US Highway 395 on the asphalt shoulder in front of the entrance to Cecil's Sporting Goods Store. Disc located in a hole 2" deep in the asphalt.				
224. Lee Vining, USC&GS E-273-----	979.3466	37° 56.42'	119° 07.50'	7174.0'	-221.8
	At the Lee Vining Ranger Station on the south side of State Highway 120 about 1.6 miles southwest of California State Highway Maintenance Station at Lee Vining. Bench mark located about midway between the two entrance driveways at the crossing of a telephone line. Station on ground 0.5' below disc.				
225. Casa Diablo, USC&GS Z-123-----	979.2778	37° 38.76'	118° 54.80'	7288.9'	-258.0
	At Casa Diablo Hot Springs on the north side of US Highway 395, northeast of and across the street from the Casa Diablo store. Station on ground 0.3' below the disc.				
226. Bishop, USC&GS V-124, Reset 1945-----	979.4622	37° 22.52'	118° 23.65'	4142.5'	-238.8
	About 0.9 mile north along US Highway 395 from the intersection with West Line Street in Bishop to the point where US Highway 6 leaves 395, thence 0.1 mile north along Highway 6 to its intersection with Wye Road. In the concrete base of the pump island at a Richfield Service Station on the southeast corner. Reading taken on disc.				
227. Bishop, USC&GS W-124-----	979.4627	37° 21.79'	118° 23.65'	4143.4'	-237.2
	At Bishop at the American Legion Hall on Main Street between Academy and May Streets on the north side of the main entrance. Reading on sidewalk 2.7' below disc.				
228. Big Pine, USGS BM 3985-----	979.4633	37° 09.90'	118° 17.32'	3985.5'	-228.9
	At Big Pine at the bridge over the Big Pine Creek on US Highway 395. Bench mark on curb between roadway and sidewalk on east side of road, about 0.9' above pavement. Reading on the disc.				
<b>NEEDLES</b>					
286. Needles R.R. Station, USC&GS Q-6, Reset 1961-----	979.6227	34° 50.44'	114° 36.25'	484.4'	-80.3
	At Needles in the top of the base of the northeast concrete column of the Santa Fe Depot, formerly the Harvey House. Reading on brick pavement 2.0' below disc.				
287. Needles City Hall, USC&GS "Needles"-----	979.6233	34° 50.43'	114° 36.34'	482.6'	-79.8
	At the City Hall building (formerly A.T.&S.F. Employees Hall) in Needles on the sidewalk just north of the front steps and on the east side. Reading on sidewalk 5.8' below disc which is in the top of the east bannister.				
288. Needles Pendulum Station, US-1026-----	979.6219	34° 49.96'	114° 35.72'	485.5'	-80.4
	Approximately 0.7 miles east of Needles, on the south side of Interstate Highway 40, and just west from the location of a former railroad spur crossing highway, 244' S. 35° W. from the center of the intersection of the Highway and the spur track. Disc not recovered, approximate position occupied.				

## NEEDLES—Continued

Station	Observed gravity	Latitude	Longitude	Elevation	Simple Bouguer anomaly
289. Chemehuevi Valley, USC&GS J-161-----	979.5491	34° 30.38'	114° 38.90'	1458.2'	-67.3
On the northeast slope of Chemehuevi Valley on the east side of US Highway 95, about 25 miles south of Needles and 24 miles north of Vidal Junction, 3.6 miles south of the junction of a road leading to Havasu Lake and 1.9 miles south of a road leading southwest toward Chemehuevi Wash, at the top of a small hill. Reading on the disc.					
290. Vidal, USC&GS T-160-----	979.5880	34° 07.20'	114° 30.55'	627.5'	-45.9
At Vidal at the northeast corner of the intersection of Vidal Avenue and Fitz Street, 90' east of the center line of Vidal Avenue, 50' north of the center line of Fitz Street and 98' south of the A.T.&S.F. railway tracks. Reading on the disc.					
291. Fenner, USC&GS "Fenner Tri- angulation Station"-----	979.5040	34° 46.26'	115° 11.08'	2080.0'	-97.4
On the south side of Interstate Highway 40, about 3 miles south of Fenner. Reading on ground 0.6' below disc.					
292. Amboy Pendulum Station, US-1025-----	979.5873	34° 33.46'	115° 44.22'	632.8'	-83.0
Approximately 0.5 mile east of Amboy on the south side of Interstate Highway 40, 970' S. 85° E. from the southeast corner of the first highway bridge east of town, area now used as a dump. Reading 0.4' below disc which is a standard gravity mark stamped "Amboy 1939".					
<b>REDDING</b>					
33. Redding R.R. Station, USC&GS J-78-----	980.1354	40° 35.02'	122° 23.52'	556.5'	-63.6
At Redding at the Southern Pacific Railroad Station, in the foundation just east of the southwest corner. Reading 0.4' below vertical disc on concrete sidewalk.					
34. Redding, USC&GS J-15-----	980.1355	40° 34.96'	122° 23.51'	554.7'	-63.6
At Redding at the Lorenz Hotel building midway between California Street and the Southern Pacific Co. Railroad tracks, in the north face of the northwest sandstone pillar. Reading on sidewalk 1.3' below disc.					
35. Redding City Hall, USC&GS I-15-	980.1336	40° 35.18'	122° 23.42'	556.0'	-65.7
At the City Hall in Redding at the intersection of Market and Shasta Streets, at the southeast corner of the alcove facing Market Street, on the floor of a telephone booth. Reading on the disc.					
36. Redding Airport, USC&GS H-742	980.1293	40° 30.60'	122° 17.88'	494.3'	-67.0
At the Redding Airport in front of the Terminal Building about 30' southeast of a barrier fence, 35' southwest of the entrance to the terminal through barrier gate. Reading on the disc in the black top at pavement level. (Approximate location of Woollard airport base WA 208.)					
37. Red Bluff, East, USC&GS Z-839--	980.1120	40° 11.15'	122° 11.09'	267.8'	-69.9
2.7 miles east of Red Bluff on State Highway 99, at the junction of State Highway 36, on the north side of Highway 99, in the southeast part of the triangle formed by the junction. Reading 0.4' above the ground on the disc.					
38. Red Bluff, USC&GS X-839-----	980.1098	40° 10.65'	122° 13.91'	287.0'	-69.3
At Red Bluff 0.2 mile northeast of the Court House along State Highway 99 at the southwest end of a large bridge over the Sacramento River. Reading is on the sidewalk 3.1' below disc which is on the concrete bridge railing.					
39. Red Bluff, Tehama County Court House, USC&GS E-137-----	980.1086	40° 10.59'	122° 14.09'	305.8'	-69.2
At Red Bluff at the east (main) entrance to the Tehama County Court House. Reading taken on the disc which is on the north end of the steps on the third step from the bottom.					

## REDDING—Continued

Station	Observed gravity	Latitude	Longitude	Elevation	Simple Bouguer anomaly
40. Red Bluff Airport (Woollard Airport Base WA-207).....	980.1045	40° 09.35'	122° 15.00'	341' (?)	-69.4
	At the Red Bluff Airport (Bidwell Field). Reading taken on the field about 2' from the north side of passenger gate.				
41. Tehama Pendulum Station, U.S. 235.....	980.1238	40° 01.60'	122° 07.27'	213.9'	-46.3
	On the north side of D Street on sidewalk between Cavalier and 2nd Streets, by a telephone pole, about 105' from 2nd Street near location of the old Clark Building. Reading taken in middle of sidewalk about 1' above ground level. Actual site of pendulum station was in the building.				
42. Weaverville, C.D.H. M-77.....	980.0169	40° 43.60'	122° 56.00'	2011.3'	-107.6
	At Weaverville on the east side of State Highway 299 on a bridge, 100 yards southeast of the intersection of Main Street, in the top of the curb. Reading on the disc.				
43. Big French Creek, USC&GS U-76..	980.0762	40° 46.84'	123° 18.48'	1137.8'	-105.6
	On old State Highway 299 north of present road alignment on top of northwest wing wall of the old bridge over Big French Creek. Reading on the disc.				
44. Willow Creek, USGS 465.....	980.1484	40° 56.68'	123° 37.99'	461.4'	-88.6
	½ mile north of Willow Creek on west side of the highway, approximately 100' north of the junction of State Highway 96 and Three Creeks Road, on top of low boulder. Reading taken on disc which is stamped 460.951 B06.				
45. Arcata, USC&GS N-735.....	980.2224	40° 52.12'	124° 05.12'	32.9'	-33.5
	At Arcata on the base of the statue of Wm. McKinley in the city plaza between H and G streets. Reading on the disc.				
46. Eureka Post Office, USC&GS, Tidal 2.....	980.2214	40° 48.13'	124° 09.79'	43.8'	-27.9
	At the post office in Eureka at the intersection of Fifth and H Streets, at the west end of the building on the concrete retaining wall around the basement entrance. Reading on ground 0.1' below disc which is on the north end of the retaining wall, 6" from the building.				
47. Eureka Pendulum Station, U.S. 238.....	980.2220	40° 48.12'	124° 09.79'	39.4'	-27.6
	At Eureka in the basement of the Post Office at 5th and H Streets on the floor near the center of the north wall. Approximate location of pendulum station.				
48. Eureka Post Office (Woollard's Station).....	980.2217	40° 48.14'	124° 09.77'	45' (?)	-27.5
	At Eureka on the southwest corner of the intersection of 5th and H Streets, northeast of the Post Office. Reading on the sidewalk by the traffic signal.				
49. Fortuna, USC&GS K-100.....	980.1756	40° 35.82'	124° 09.43'	61.4'	-54.3
	At Fortuna at the north entrance to the elementary school on I. Street on the east bannister. Reading on the disc.				
50. South Fork, USC&GS Y-638.....	980.1279	40° 20.25'	123° 54.09'	163.6'	-72.8
	1.0 mile southeast along the Northwestern Pacific Railway from the station at South Fork on the east end of a trestle at a County Road underpass. Reading taken on the disc.				
51. Weott, USC&GS D-101.....	980.1294	40° 19.44'	123° 55.51'	159.0'	-70.4
	At the south end of Weott on the east side of old US Highway 101 by a sign pointing to the freeway, at edge of a redwood grove, flush with ground. Reading on the disc.				
52. Garberville, USC&GS, "Garberville 1".....	980.0928	40° 06.06'	123° 47.63'	532.5'	-64.7
	At Garberville in the sidewalk on the east side of US Highway 101 ½ block north of the intersection of Church Street and directly across from the Garberville Theater. Reading on the disc.				

## REDDING—Continued

Station	Observed gravity	Latitude	Longitude	Elevation	Simple Bouguer anomaly
53. Garberville, USC&GS XX-101	980.0928	40° 06.06'	123° 47.64'	532.8'	-64.7
	At Garberville on the west side of US Highway 101, north of the intersection of Church Street in front of the Empire Barber Shop, in the sidewalk. Reading on the disc.				
54. Walker Ridge, USC&GS Q-252	979.9737	40° 01.86'	123° 36.89'	2228.4'	-75.9
	1.0 miles northeast along the Island Mountain Road from the intersection of the Bell Springs Road, in Section 16, T. 5 S., R. 5 E., 50' southwest of a clump of oak trees and 15' north of the road by a rock cairn which covers the disc.				
55. Marr Ranch, USC&GS S-252	979.9857	40° 02.78'	123° 34.05'	1934.9'	-82.8
	4.0 miles east along the Island Mountain Road from the junction of the Bell Springs Road, in Section 12, T. 5 S., R. 5 E., 50' south of a ranch house and 15' northwest of the road into the ranch. Reading on ground 0.5' below disc.				
56. Island Mountain, USC&GS U-252	979.9977	40° 02.07'	123° 32.39'	1702.1'	-83.8
	On the Island Mountain Road at the top of the ridge (Island Mt.) between Chamise Creek and Pine Creek, in Section 7, T. 5 S., R. 6 E., 14' south of the road. Reading on ground 0.5' below disc.				
SACRAMENTO					
106. Riverton Bridge	979.7613	38° 46.23'	120° 26.84'	3231'	-116.6
	On US Highway 50 at Riverton on the west end of a bridge (No. 25-08) over the south fork of the American River, on the south side of the road at the bridge abutment corner at pavement level.				
107. Camino, USC&GS A-127	979.7844	38° 44.38'	120° 40.27'	3193.0'	-93.0
	0.2 mile east from the Post Office at Camino along old US Highway 50 at the northwest corner of a junction with a road leading north. Reading on the disc.				
108. Placerville—El Dorado County Court House, USC&GS "Placerville"	979.8693	38° 43.80'	120° 47.90'	1866.2'	-86.9
	At the El Dorado County Court House in Placerville at the south entrance in top of the west balustrade. Reading on the disc.				
109. Ham's Station, USC&GS F-184	979.6149	38° 32.68'	120° 22.59'	5433.2'	-111.0
	At Ham's Station on the south side of State Highway 88, 50' south of the building on a large boulder. Reading on the disc.				
110. Plymouth, USC&GS N-202	979.9163	38° 28.90'	120° 50.62'	1085.8'	-64.9
	On the east side of State Highway 49, 150' south of the junction with a road leading to the business section of Plymouth. Reading on ground 0.2' below disc.				
111. Sutter Creek, USC&GS "Sutter Creek"	979.8936	38° 23.48'	120° 48.09'	1197.4'	-73.0
	At Sutter Creek at south city limits in the parkway dividing State Highway 49 at a flagpole. Reading on concrete sidewalk 0.3' below disc.				
112. Ione, USC&GS L-795	979.9656	38° 20.34'	120° 55.99'	326.5'	-48.6
	Approximately one mile south of Ione along State Highway 124, about 0.1 mile south of a railroad crossing and on the east side of the former alignment of the highway, north of a road leading northeast. Reading on ground 0.6' below disc.				
113. Jackson, USC&GS "Jackson" Reset 1954	979.8886	38° 21.02'	120° 46.43'	1199.8'	-74.2
	At Jackson near the northeast corner of California and Main Streets, in front of the Krabbenhoft Building. Reading on sidewalk by disc.				

## SACRAMENTO—Continued

Station	Observed gravity	Latitude	Longitude	Elevation	Simple Bouguer anomaly
114. Jackson, USC&GS U-202-----	979.8855	38° 20.80'	120° 46.00'	1234.8'	-74.9
	At Jackson at the northwest corner of intersection of Bright Avenue and Broadway, 30' south of an old stone building. Station on ground 0.4' below disc.				
115. Big Meadows, USC&GS H-271---	979.4999	38° 24.97'	120° 06.72'	6536.1'	-148.5
	At Big Meadows Public Camp Ground, 49' south of center line of State Highway 4. Reading on ground 0.1' below disc.				
116. Big Trees, USC&GS D-915-----	979.6361	38° 17.76'	120° 16.99'	4869.7'	-101.7
	0.4 mile southwest of the Dorington Hotel along State Highway 4. On north side of road at a highway turn out. Reading on the disc.				
117. San Andreas, USC&GS D-217----	979.8872	38° 11.78'	120° 40.81'	1006.8'	-73.7
	At San Andreas in the north wall of United California Bank Building at the southwest corner of Main and St. Charles Streets. Reading on sidewalk, 1.0' below disc.				
118. Angels Camp, USC&GS W-194---	979.8600	38° 04.11'	120° 32.31'	1378.8'	-67.4
	At Angels Camp at the northeast corner of the intersection of South Main Street and Sierra Street, in the top of the southeast corner of the concrete base of a monument. Reading on sidewalk 0.1' below disc.				
119. Twain Harte, USC&GS R-907-----	979.6963	38° 02.30'	120° 13.81'	3637.6'	-92.9
	At Twain Harte along Meadow Drive about 300' northwest of Twain Harte Lodge near the east corner of the fire station. Reading on the disc.				
120. Longbarn School, USC&GS Z-907	979.6011	38° 05.50'	120° 08.18'	4956.0'	-113.7
	At Longbarn on State Highway 108 at the Longbarn Grammar School, 40' east of the east corner of the school, 55' northwest of the center line of the Highway. Reading on the disc.				
121. Applegate Pendulum Station, US-1038-----	979.9150	38° 59.9'	120° 59.4'	1976.1'	-58.3
	0.2 mile south of the Post Office at Applegate on the east side of old US Highway 40 near southwest corner of a house about 278' east of the highway. A standard gravity disc stamped "Applegate 1939". Reading on ground 0.4' below disc.				
122. Auburn—Placer Co. Court House, USC&GS N-201-----	979.9533	38° 53.79'	121° 04.54'	1234.2'	-55.5
	At the Placer County Court House in Auburn on the step in front of the main entrance on the southeast side of the building. Reading on the disc.				
123. Newcastle Pendulum Station, US-1037-----	979.9508	38° 52.49'	121° 07.68'	991.8'	-70.7
	At Newcastle east of Interstate Highway 80 on Chantry Hill at the west edge of a baseball park, 35' from the northeast corner of a house. A standard gravity disc stamped "Newcastle 1939". Reading on ground 0.5' below disc.				
124. Roseville, USC&GS F-855-----	979.9864	38° 44.70'	121° 17.26'	161.4'	-73.4
	At Roseville at the front (north) entrance to the Vernon Street School on the west balustrade about 1' above ground level. Reading taken on the disc.				
125. Sacramento North Pendulum Station, US-1035-----	980.0095	38° 36.25'	121° 26.95'	36.2'	-39.3
	In North Sacramento on the south side of Blackwood Street in a field, between two oak trees 20' apart. About 120' south of the center line of Blackwood Street. About 198' S 20° E. from the southeast corner of the house at 1001 Blackwood Street. A standard gravity disc stamped "Sacramento 1939". Reading on ground 0.7' below disc.				

## SACRAMENTO—Continued

Station	Observed gravity	Latitude	Longitude	Elevation	Simple Bouguer anomaly
126.* Sacramento Pendulum Station, US-236.....	980.0152	38° 34.84'	121° 29.78'	19.0'	-38.7
					At Sacramento at the old Sacramento Post Office at 7th and K Streets in the basement directly east of the furnace room on the concrete floor. Approximate location of pendulum station.
127. Sacramento State Capitol, USC&GS 21-B.....	980.0145	38° 34.58'	121° 29.49'	21.4'	-38.9
					At the State Capitol Building in Sacramento on the lawn near the southeast corner on top of a granitic block about 2' above ground level. Reading on top of the disc.
128. Woodland, USC&GS "Woodland" Reset 1957.....	980.0359	38° 40.74'	121° 46.33'	65.1'	-23.9
					At Woodland in front of the City Hall on the south side of Court Street on ground just east of Bell Monument, at the northeast corner of the Woodland Fire Department building. Reading beside disc on ground.
129. Davis, USC&GS "Davis" 2.....	980.0127	38° 32.48'	121° 44.89'	49.7'	-35.9
					On the Davis Campus of the University of California in the center of "the quadrangle" on the west side of a concrete walk. Reading on the disc.
130. Dixon, USC&GS U-128.....	979.9887	38° 27.22'	121° 49.25'	65.6'	-51.2
					At the Mace Meat Co. plant just north of the town of Dixon on concrete floor at the truck loading entrance. Reading on the disc.
131. Lockford School, USGS BM.....	979.9827	38° 09.64'	121° 08.98'	100.2'	-29.5
					At the old Lockford School on the east side of Jack Tone Road south of the railroad tracks about 0.2 mile south of Lockford. At northwest corner of a fence around the school. Station on ground 0.9' below disc.
132. Lodi, USGS K9-45B.....	980.0157	38° 06.97'	121° 16.31'	44.7'	+4.1
					1.2 mile south along the Southern Pacific tracks from the station at Lodi just northeast of the junction of the tracks and State Highway 12. Station at ground level 0.8' below the disc.
SALTON SEA					
332. Desert Center, USC&GS G-132..	979.5161	33° 42.78'	115° 24.20'	906'	-67.1
					At Desert Center in the north wall of the Desert Center Cafe and Greyhound Bus Depot, just west of the front door. Reading taken 3.5' below disc on the sidewalk.
333. Blythe—Palo Verde College, USC&GS J-133.....	979.5637	33° 36.66'	114° 35.33'	269.8'	-49.2
					At the Palo Verde College in Blythe, at the south side of the building in the top of the top step at the foot of the east column of the main entrance. Reading on the disc.
334. Blythe, USC&GS V-134.....	979.5662	33° 36.18'	114° 36.28'	263.3'	-46.4
					At the intersection of Lovekin Boulevard and 14th Avenue about ½ mile south of Interstate Highway 10 at Blythe. 40' west of the center line of Lovekin Boulevard and 20' south of the center line of 14th Avenue. Reading on ground 0.5' below disc.
335. Niland Triangulation Station, USC&GS "Niland 1934".....	979.5727	33° 13.84'	115° 31.09'	-164.7'	-34.7
					Approximately one mile south of Niland along State Highway 111 on an island formed by the intersection of Highway 111 and a road leading northeast. Reading by witness post, disc not found.



## SAN BERNARDINO

Station	Observed gravity	Latitude	Longitude	Elevation	Simple Bouguer anomaly
293. Ludlow, USC&GS Y-161-----	979.5178	34° 43.30'	116° 09.48'	1774.9'	-97.7
	At Ludlow on A.T.&S.F. Railway, 23' southeast of the southeast corner of a fence around the yard of the Standard Oil Co. plant in the top of the east end of the north concrete headwall of culvert No. AAA 694. Reading on the disc.				
294. Newberry Pendulum Station, US-1024-----	979.5162	34° 50.22'	116° 40.83'	1837.9'	-105.3
	At Newberry, 0.5 mile northwest of the railroad station, on the first road leading north from Interstate Highway 40 west of the railroad station. Station located 0.35 mile north of the railroad, 156' west of the center line of road and 12' north of a road leading west. A standard gravity disc marked "Newberry 1939". Reading on ground 0.2' below disc.				
295. Barstow, USC&GS J-3, Reset 1936	979.5087	34° 54.10'	117° 01.50'	2131.1'	-100.7
	At the Addy Waterman Elementary School in Barstow on the northeast corner of Second and Huchison Streets, on a banister at the west entrance. Reading on the disc.				
296. Beecher's Corner, USGS 2483-B-	979.4999	34° 59.64'	117° 33.91'	2482.9'	-96.1
	1.4 miles west of Beecher's Corner on State Highway 58, 42' south of the center line of the A.T. & S.F. Railroad track and 5' west of a telephone pole. Reading 1.5' below disc on ground.				
297. Victorville, USC&GS R-41-----	979.4299	34° 32.22'	117° 17.54'	2714.9'	-113.7
	At Victorville, at Forest Park, 150' south of the west corner of A.T.&S.F. Railroad Station and 29' west of the west corner of a 6' high granite monument inscribed "Forest Park, Victorville". Reading on the disc.				
298.* Highland Pendulum Station, US-242-----	979.4762	34° 07.63'	117° 12.45'	1288.1'	-118.6
	At Highland at the former Highland Congregational Church on the corner of the Second Street south of the A.T.&S.F. tracks, in the furnace room on the east side of the old basement. Approximate location of pendulum station.				
299. San Bernardino Co. Court House, USC&GS G-526-----	979.4968	34° 06.31'	117° 17.28'	314.7'	-154.6
	At San Bernardino County Court House at the intersection of 3rd Street and Arrowhead Avenue, set vertically in the south concrete wall, 4.5' west of the southeast corner of the building. Reading 2.4' below and about 10' southeast of disc on sidewalk.				
300. Pomona Pendulum Station, US-1023-----	979.5498	34° 03.8'	117° 46.4'	831.0'	-67.1
	On the north side of West Holt Avenue, about 1.5 miles west of the Pomona business district, at the Orange Blossom Auto Court. About 490' north of the center line of Holt Avenue, in a trailer parking area 266' west of the center line of Weber Street. A standard gravity disc marked "Pomona 1939". Reading over the disc.				
SAN DIEGO					
39. Ocotillo Triangulation Station, USC&GS "Ocotillo 1935"-----	979.4611	32° 44.02'	116° 00.07'	474.5'	-67.0
	1.9 miles southwest along Interstate Highway 8 from Coyote Wells at the northwest corner of a dirt road leading north to Ocotillo, 119' north of the center line of the Highway and 60' west of the center line of the dirt road. Reading beside disc on ground.				
40. Jacumba, USC&GS R-58-----	979.2973	32° 36.99'	116° 11.40'	2829.0'	-80.0
	At Jacumba at the northwest corner of the Jacumba Hotel, between the porch and the sidewalk, 41.8' southeast of the center line of Interstate Highway 8 and 1.6' north of the west corner of the porch. Reading on sidewalk 2' north of disc at same elevation.				

## SAN DIEGO—Continued

Station	Observed gravity	Latitude	Longitude	Elevation	Simple Bouguer anomaly
341. Descanso Valley, USC&GS B-736.	979.3247	32° 50.55'	116° 36.31'	3465.7'	-32.9
	0.5 mile northeast along Interstate Highway 8 from the junction of Riverside Drive at Descanso junction at the summit of a grade, in the top of a granite boulder, 36' west of the center of the north end of a 24" metal culvert No. 561 + 48, and 32' north of the center line of the highway. Reading on the disc.				
342. Alpine, USC&GS F-737-----	979.4434	32° 50.26'	116° 46.66'	1689.3'	-20.3
	0.7 mile west along Interstate Highway 8 from the Post Office at Alpine, northeast of the sewage disposal plant, 46' south of the center line of the highway. Reading on the disc.				
343. San Diego Lindbergh Field (Woollard Airport Base WA 85)	979.5370	32° 43.98'	117° 10.50'	14'	-18.6
	The Woollard Station is located inside the terminal lobby at Lindbergh Field at the middle door to the street, at right side (facing out). This reading was taken just outside the door on sidewalk (same level), probably 2' or 3' away.				
344. San Diego Post Office, USGS H-17	979.5281	32° 42.89'	117° 09.36'	62.6'	-23.2
	At San Diego at the north entrance to the U.S. Post Office on the corner of 9th and E Streets, just west of the door on the top granite step. Reading 0.75' below disc.				
345. San Diego Co. Court House, USGS 42 S.D. Reset 1960-----	979.5299	32° 42.98'	117° 09.85'	38.2'	-23.0
	At the San Diego County Court House on east portion of wall at Broadway (South) entrance to Court House building. Reading on concrete sidewalk 2.8' below disc.				
346. San Diego Pendulum Station, US-240-----	979.5302	32° 42.82'	117° 09.89'	22.0'	-23.5
	At San Diego at the Federal Building (old post office) at F and State Streets in the basement, outside door to telephone equipment room. Approximate location of pendulum station.				
347. San Diego Federal Building, USC&GS Tidal 9-----	979.5299	32° 42.82'	117° 09.92'	26'	-23.6
	At San Diego at the northwest corner of the Federal Building at the intersection of F and State Streets, 1' east of the northwest corner. Reading on lawn 3.8' below disc.				
SAN FRANCISCO					
155. San Rafael, USC&GS Y-107-----	980.0123	37° 58.33'	122° 31.29'	8.0'	+11.1
	At San Rafael on Tamalpais Avenue between 3rd and 4th Streets, across the tracks from North-western Pacific Railroad Station in the wall of a building. Reading on sidewalk 3.6' below disc.				
156. San Francisco Customs House, USC&GS G-329-----	979.9969	37° 47.82'	122° 23.99'	10.7'	+11.2
	On the north side of the Customs House near the northeast corner of the building at Jackson and Battery Streets, San Francisco. Reading 3.1' below disc on sidewalk.				
157. San Francisco Ferry Building---	979.9949	37° 47.69'	122° 23.52'	8.1'	+9.2
	At the Ferry Building at the foot of Market Street, in front of the building in the arcade on the south wing just east of a pillar and about 20' west of Door A-26.				
158. San Francisco Federal Building (Woollard Station)-----	979.9930	37° 46.81'	122° 24.81'	11.5'	+8.9
	At the Federal Building in San Francisco on the northeast corner of Fulton and Hyde Streets, used as a loading point by Navy buses, on the floor at the foot of the staircase leading up from the ground floor, at the southwest corner of the building.				

## SAN FRANCISCO—Continued

Station	Observed gravity	Latitude	Longitude	Elevation	Simple Bouguer anomaly
59. San Francisco State Building, USC&GS X-108-----	979.9926	37° 46.84'	122° 25.02'	63.2'	+11.5
	At San Francisco Civic Center at the California State Building on McAllister Street, between Larkin and Polk Streets, on the lawn just west of McAllister Street entrance. Reading on the disc.				
60. San Francisco—Golden Gate Park (Woollard Pendulum Station GW 54)-----	979.9866	37° 46.18'	122° 27.93'	242.4'	+17.2
	In Golden Gate State Park, in the Paleo. Laboratory of the North American Hall, 10' from the north wall in front of a bench along the west wall at a small cross in the concrete floor.				
61. San Francisco—Golden Gate Park, North American Hall (Outside Site)-----	979.9869	37° 46.19'	122° 27.92'		
	In San Francisco at Golden Gate Park in front of the northeast entrance to the North American Hall at ground level at the bottom of the steps on the northwest edge of the sidewalk, adjacent to statue of Francis Scott Key.				
62. San Francisco Airport-----	979.9883	37° 37.08'	122° 22.88'		
	At San Francisco International Airport 30' south of Station 163 at old gate 25 (station destroyed by construction in 1963).				
63. San Francisco Airport (Woollard Airport Base WA 86)-----	979.9883	37° 37.08'	122° 22.88'	10'	+18.2
	At old gate 23, San Francisco International Airport, at field level. (Station destroyed by construction in 1963).				
64. San Francisco Airport, USC&GS WB-1-----	979.9883	37° 37.06'	122° 22.97'	9.0'	+18.1
	At the San Francisco International Airport, at older (north) wing of the terminal building on the lower or baggage level. Station is located about 100' northeast of the north door to the building (door to car rental area) and is a Standard U.S.C.&G.S. disc located in the base of a pillar in the middle of a service entrance to the building. Reading on the disc.				
55. San Francisco Airport (Woollard Airport Base WA 87)-----	979.9883	37° 37.01'	122° 22.98'	10'	+18.3
	At the main entrance of the north wing of the San Francisco International Airport, lower level, at the curb opposite the second pillar from the south.				
56. Redwood City, San Mateo Co. Court House-----	979.9730	37° 29.20'	122° 13.71'	10'	+14.4
	In Redwood City at the San Mateo County Court House at the north side of the Broadway entrance on sidewalk below dedication plaque.				
57. Woodside "F", USC&GS B-388--	979.8215	37° 24.67'	122° 18.29'	2315.4'	+7.8
	On State Highway 35 at Skeggs Point Scenic View on the northeast side of the asphalt parking area in the top of the southwest side of a concrete base for a granitic boulder. Reading on the disc.				
58. Woodside "E", USC&GS K-387, Reset 1956-----	979.8536	37° 23.48'	122° 16.96'	1853.9'	+13.9
	1.6 miles northwest along State Highway 35 from intersection of La Honda Road, about 38' southwest of the highway at a pull out at the northwest end of a curve. Reading on the disc.				
9. Woodside "D", USC&GS D-152--	979.8777	37° 23.20'	122° 15.82'	1463.3'	+14.9
	Northwest of the intersection of La Honda Road and State Highway 35, in the triangle formed by Highway 35, La Honda Road, and a north-south side road. Reading on the disc.				
0. Woodside "C", USC&GS B-152--	979.9056	37° 23.87'	122° 15.40'	1019.3'	+15.2
	3.8 miles south along La Honda Road from the Woodside School at Woodside on the southwest side of the road across from a concrete retaining wall. Reading on the disc.				

## SAN FRANCISCO—Continued

Station	Observed gravity	Latitude	Longitude	Elevation	Simple Bouguer anomaly
171.* San Gregorio, USC&GS U-211.....	979.9563	37° 19.63'	122° 23.12'	61.0'	+14.5
	At San Gregorio, 94' east and across the street from the general store and Post Office. Reading on the ground by disc.				
172.* San Gregorio Pendulum Station, US-257.....	979.9564	37° 19.58'	122° 23.25'	54.1'	+14.4
	At San Gregorio about 400' west of the San Gregorio Hotel on the south side of the road to La Honda in the northwest end of a pump house, a small two story building surmounted by a water tank. Approximate location of pendulum station.				
173. Menlo Park, USGS 1 J D.....	979.9587	37° 27.34'	122° 10.18'	53'	+5.3
	At Menlo Park in the sidewalk at the northeast corner of building 2 of the U.S. Geological Survey regional office on Middlefield Road. Reading taken on the sidewalk over the disc.				
174. Palo Alto, USC&GS T-110.....	979.9561	37° 26.90'	122° 09.50'	47.5'	+3.0
	At Palo Alto west of the intersection of University Avenue and Cowper Street, at the President Hotel, on the south side of the street, set vertically in the north wall. Reading taken on the sidewalk 3.7' below disc.				
175.* Palo Alto Pendulum Station, US-256.....	979.9559	37° 26.66'	122° 09.63'	47.9'	+3.2
	At Palo Alto in the old Post Office (now the Pacific Store) at the north corner of Emerson and Hamilton Streets. Reading taken in the north corner of the basement on the concrete floor. Approximate location of pendulum station.				
176. Stanford University (Woollard Station WU-3).....	979.9487	37° 25.64'	122° 10.38'	102'	+0.8
	At Stanford University at the Lloyd Noble Laboratory for Geophysics at the rear entrance to the north wing of the building at the door stop for the west door.				
177. Stanford University, USC&GS U-110.....	979.9496	37° 25.61'	122° 10.21'	88.5'	+0.8
	At Stanford University in the quadrangle 0.15 mile north of the intersection of Lomita Drive and Santa Teresa Street 1' north of the southeast corner of the graphic arts building. Reading taken 3.6' below disc on sidewalk.				
178. Sunnyvale—Moffett Field.....	979.9422	37° 24.55'	122° 03.00'	27'	-8.7
	At the street entrance to the Operations Office at Moffett Field in the center of the sidewalk at the edge of a blacktop roadway.				
179. Sunnyvale, Fremont High School, USC&GS E-323.....	979.9158	37° 21.18'	122° 01.91'	161.1'	-22.1
	In Sunnyvale at the main entrance to Fremont High School, northwest of the junction of Fremont Avenue and State Highway 9, set in the east face of the concrete archway. Reading 0.5' below disc on concrete porch.				
180. Berkeley, University of California, USC&GS L-29.....	979.9702	37° 52.33'	122° 15.41'	320.9'	-3.5
	At the University of California in Berkeley, on the north side of the base of Sather Tower at the northeast corner. Reading on the disc.				
SAN JOSE					
181. Livermore, USC&GS Q-929.....	979.9015	37° 41.82'	121° 47.12'	442.2'	-49.6
	North of Livermore along Junction Avenue, 0.4 mile southeast of US Highway 50, on the southwest side of the street about 90' west of the center of the junction of the road to the Livermore Sky Ranch. Reading on the disc.				

## SAN JOSE—Continued

Station	Observed gravity	Latitude	Longitude	Elevation	Simple Bouguer anomaly
182. Stockton Post Office, USC&GS Tidal 5-----	979.9689	37° 57.44'	121° 17.26'	16.0'	-30.6
	At Stockton at the northwest corner of the intersection of north San Joaquin Avenue and East Lindsay Street, at the south entrance to the Post Office in the top of the northwest corner of a granite landing. Reading on the disc 3.2' above ground surface.				
183. Lathrop, USC&GS G-799-----	979.9513	37° 49.56'	121° 16.45'	17.7'	-36.5
	0.4 mile north along the Southern Pacific Railroad from the station at Lathrop at the Lathrop Road crossing. 225' south of the Lathrop Road and 72' east of Seventh Street. Reading on the ground 0.5' below disc.				
184. Manteca, USC&GS D-83-----	979.9454	37° 47.84'	121° 12.82'	38.1'	-38.7
	At Manteca 0.3 mile east along Yosemite Avenue from the Southern Pacific Railroad Station, 50' south of the center line of the avenue in the top of the concrete steps leading to the American Legion Hall. Reading on the disc.				
185. Tracy High School, USC&GS "Tracy"-----	979.9352	37° 44.48'	121° 25.19'	47.9'	-43.4
	At Tracy at the Tracy High School near the junction of Northeast Street and Belvedere, at the southwest corner of the athletic field in a flower garden. Reading on the disc.				
186. Sonora—Tuolumne Co. Court House, USGS "1825"-----	979.8321	37° 59.12'	120° 22.99'	1823.4'	-61.3
	At Sonora at the Court House between West Jackson and Yaney Streets, in the northeast face of a concrete retaining wall along the northeast side of the Court House yard, 70' southwest of the center line of Yaney Street, 72' northwest of the center line of Jackson Street, 2' southeast of the steps leading to the Court House. Reading on the sidewalk 2.5' below disc.				
187. Oakdale Union School, USC&GS "Oakdale 1943"-----	979.9241	37° 46.04'	120° 51.28'	149.8'	-50.7
	At Oakdale Union High School on the lawn at the northeast corner of the school, 38' south of the center line of Magnolia Avenue. Reading on the disc.				
188. Modesto, USC&GS T-83-----	979.9316	37° 38.35'	121° 0.06'	85.7'	-35.8
	Opposite the Southern Pacific Company Railroad Station at Modesto, at the intersection of 8th and J Streets, 2.5' east of 8th Street, 48' southwest of the southwest track. Reading on the ground 0.9' below disc.				
189. Modesto Pendulum Station, US-1033-----	979.9310	37° 37.12'	120° 59.38'	80.3'	-34.9
	Station is at the Avalon Trailer Court, about 1 mile southeast of Modesto along old US Highway 99, on the southwest side of the Southern Pacific Railroad tracks, 0.3 mile west of the intersection of the Southern Pacific and Western Pacific tracks. Reading on the ground 0.5' below disc.				
190. Turlock, USC&GS F-84-----	979.9189	37° 29.65'	120° 50.72'	102.9'	-34.9
	At Turlock at the Southern Pacific Company Railroad Station, in the top of the south corner of the concrete floor of the porch, 5' northeast of the west corner of the station. Reading on the disc.				
191. Mt. Hamilton, DWR 1960 ECC--	979.6492	37° 20.47'	121° 38.52'	4212.9'	-44.7
	At Lick Observatory on Mt. Hamilton at the base of the flag pole just southwest of the original observatory building. Reading taken on the disc.				
192. San Jose, USC&GS M-176-----	979.9003	37° 20.93'	121° 51.82'	88.7'	-41.7
	At San Jose along Santa Clara Street about Midway between North 27th Street and the Western Pacific Railroad on the north side of the street in top of the northeast end of a concrete wall. Reading on the ground 2.8' below the disc.				

## SAN JOSE—Continued

Station	Observed gravity	Latitude	Longitude	Elevation	Simple Bouguer anomaly
193. San Jose Post Office, USC&GS D-886-----	979.9172	37° 20.28'	121° 53.46'	90.1'	-23.7
	At the Post Office in San Jose at the intersection of North First Street and West St. John Street at the southeast entrance to the building in the top of the northwest granite balustrade, about 3½' higher than the sidewalk. Reading on the disc.				
194. Gilroy Post Office-----	979.9041	37° 00.69'	121° 34.20'		
	At Gilroy on 3rd Street at the northwest corner of the Gilroy Post Office on a blacktop strip (ground level) next to the Post Office.				
195. Gilroy—Eliot School, USC&GS A-874-----	979.9013	37° 00.36'	121° 33.65'	190.8'	-4.8
	At the Eliot Elementary School in Gilroy, 0.3 mile east along State Highway 152 from US Highway 101. Reading on the ground 1.3' below disc, which is in the concrete south foundation wall.				
196. Pacheco Pass, USC&GS V-152---	979.8201	37° 03.90'	121° 12.57'	1388.5'	-19.4
	At the summit of Pacheco Pass on the south side of State Highway 152, about 104' south of the center line of the highway. Reading on the disc.				
197. San Luis Dam, USC&GS A-926--	979.8697	37° 03.31'	121° 06.05'	297.0'	-34.2
	(Station will be under water upon completion of San Luis Dam.) 13.9 miles west along old State Highway 152, from the intersection of 6th Street at Los Banos. On the south side of a curve about 100' south of the center line of the highway. Reading on the ground 0.2' below disc.				
198. Los Banos Post Office, USC&GS B-804-----	979.8477	37° 03.50'	120° 50.95'	116.8'	-67.4
	At the junction of 6th and M Streets, in Los Banos in the southwest concrete wall of the Post Office. Reading on the ground 2.7' below disc.				
199. Chowchilla Ranch, USC&GS T-153-----	979.8786	37° 05.00'	120° 29.53'	135.7'	-37.5
	On the south side of State Highway 152, at the junction with State Highway 59, south of Merced. Reading on top of the disc.				
200. Merced Airport (Woollard airport station)-----	979.9003	37° 17.30'	120° 30.89'		
	At Merced Airport at the barrier gate on the field side of the terminal in front of the booth at the gate to the field.				
201. Merced Airport, USC&GS B-939-	979.9004	37° 17.32'	120° 30.89'	152.5'	-32.5
	At Merced Municipal Airport at the west corner of the United Air Lines office building. Reading on the sidewalk 1.6' below disc.				
202. Merced Co. Court House, USGS 171.568-----	979.9018	37° 18.40'	120° 28.99'	168.5'	-31.7
	At the County Court House in Merced, at 21st and M Streets, in the southwest wall of the building. Reading on the sidewalk 2.7' below disc.				
203. Coulterville, USGS 18 RS--1683--	979.8090	37° 42.65'	120° 11.75'	1683.2'	-68.9
	At Coulterville east of State Highway 49, and south of a road leading northeast, on the first concrete step of an old red building. Reading on the disc.				
204. Bagby, USC&GS A-668-----	979.8387	37° 36.73'	120° 08.04'	815.8'	-82.6
	At Bagby on the west side of the north end of the Merced River Bridge. Reading taken on the concrete roadway 0.4' below disc.				
205. Cathay Post Office-----	979.8232	37° 25.95'	120° 05.81'		
	At the Post Office in Cathay at the front entrance just east of the door on the concrete floor under the letter drop.				

## SAN JOSE—Continued

Station	Observed gravity	Latitude	Longitude	Elevation	Simple Bouguer anomaly
206. Cathay, USGS 5 J D.....	979.8232	37° 25.95'	120° 05.81'	1320.6'	-52.2
At Cathay on the southeast side of State Highway 140, opposite Post Office. Reading on the ground 0.6' below disc.					

## SAN LUIS OBISPO

261. Junction State Highways 33 and 41, USC&GS L-666.....	979.7198	35° 53.43'	120° 02.75'	554.3'	-68.4
9.2 miles southeast along State Highway 33 from Avenal, at the southeast corner of the intersection of State Highway 33 and State Highway 41, 71' northeast of the center line of Highway 33 and 48½' southeast of the center line of Highway 41. Reading on the disc.					
262. Paso Robles, USC&GS L-24.....	979.7173	35° 37.55'	120° 41.29'	728.5'	-37.8
At Paso Robles at the southwest corner of 11th and Pine Streets, at the main entrance to the municipal bath house, on the first step. Reading on the disc.					
263. Avila Beach Pendulum Station, US-252.....	979.7570	35° 10.70'	120° 43.83'	43.9'	-1.1
At Avila Beach on Front Street, about 220' east of the end of San Luis Street on the concrete floor in the north end of the garage of a cottage (house number 234). Approximate location of pendulum station.					
255.* Avila Beach, USC&GS H-828.....	979.7593	35° 10.70'	120° 43.97'	19.7'	-0.2
At Avila, 75' southwest of and across the street from the center of the entrance to the former post office building (now the Avila Grocery), in the top of a concrete and rock sea wall, about 3½' southeast of the center of the concrete steps leading down to the beach, 1.3' above the sidewalk. Reading on the disc.					
256.* San Luis Obispo Court House, Bench Mark 1, City of San Luis Obispo.....	979.7501	35° 16.97'	120° 39.65'	232.8'	-5.5
At San Luis Obispo at the northeast corner of Osos and Monterey Streets, at the Osos Street entrance to the court house, on a concrete block which is in front of a monument commemorating former city and county officials. Reading taken on the step 1.1' below and just south of the bronze disc (not stamped).					
257.* Paso Robles Library, USGS 740 7 1916.....	979.7171	35° 37.56'	120° 41.36'	739.7'	-37.3
At Paso Robles at the main entrance to the public library in the top of the east balustrade. Reading taken on the disc.					

## SANTA ANA

22. Oceanside, USC&GS A-64.....	979.5713	33° 11.70'	117° 22.81'	47.4'	-20.4
In Oceanside at the corner of Cleveland and 2nd Streets, at the northeast corner of A.T.&S.F. railroad park, 100' east of the station. Reading on the disc.					
23. Oceanside Pendulum Station, US-241.....	979.5661	33° 11.84'	117° 22.42'	127'	-21.0
At Oceanside High School at 1st and Horne Streets near the southwest corner of the building, at the base of the stairs on the concrete walk against the building at basement level. Pendulum station was in this vicinity.					
24. Oceanside High School (Woollard Site).....	979.5664	33° 11.84'	117° 22.42'	127'	-20.7
At Oceanside High School, on the east corner of 1st and Horne Streets, on the curb next to a hydrant.					

## SANTA ANA—Continued

Station	Observed gravity	Latitude	Longitude	Elevation	Simple Bouguer anomaly
325. Riverside Library, USC&GS Z-1...	979.5481	33° 58.96'	117° 22.28'	857.7'	-60.5
					At the south entrance on the concrete balustrade of the Riverside County Library in Riverside. Reading on the disc about 3' above the ground.
326. Riverside Court House, USC&GS Y-1-----	979.5487	33° 58.79'	117° 22.45'	847.6'	-60.2
					At Riverside on 10th Street at the County Court House, just below a copper bolt set in the center of a small projection in the north wall, 8' west of the west edge of the steps leading to the basement. Reading on the sidewalk, 0.7' below bolt.
327. Riverside, UCR Base-----	979.5320	33° 58.46'	117° 19.51'	1072.3'	-62.9
					At Riverside at the University of California Physical Sciences Building, on a cross chiseled into the concrete on the balustrade adjacent to the steps leading to a southeast entrance.
328. Banning City Hall, USC&GS K-71	979.4040	33° 55.54'	116° 52.63'	2347.0'	-110.4
					At Banning City Hall on Ramsey Street, between 1st and 2nd Streets, set in the south wall 17' west of the southeast corner. Reading on sidewalk, 2.1' below disc.
329. Palm Springs, USC&GS N-753....	979.5230	33° 49.40'	116° 30.56'	415.0'	-98.8
					At Palm Springs Airport at the east end of Main Street, in the dividing strip midway between the two traffic lanes. Reading on the disc.
330. Indio, Roosevelt School, USC&GS H-588-----	979.5376	33° 42.88'	116° 13.10'	-15.0'	-100.9
					At Roosevelt School in Indio on the southeast corner of Towne Avenue and State Highway 111. Reading over the disc which is in a hole in the sidewalk, 1.5' north of the fence and 12' east of the northeast corner of a block wall.
331. Mecca Pendulum Station, US-1019	979.5511	33° 33.32'	116° 04.12'	-206.5'	-85.7
					Approximately 1 mile south of Mecca, about 180' north of Avenue 68 and 60' east of a northeast-southwest road which connects Avenue 68 with State Highway 111. A standard gravity disc stamped "Mecca 1939". Reading on ground beside disc.

## SANTA CRUZ

247. Madera Co. Court House, USGS 274.560-----	979.8379	36° 57.59'	120° 03.64'	271.9'	-59.4
					At Madera County Court House on West Yosemite Avenue between H and G Streets, on the north wall 5' southwest of the northeast corner. Reading on the sidewalk 2.3' below disc.
248. Firebaugh Triangulation Station, USC&GS "Firebaugh 1943"---	979.8465	36° 51.73'	120° 27.66'	149.7'	-49.6
					0.4 mile northwest along the Southern Pacific Railroad from the station at Firebaugh, 31' west of the west corner of State Highway 33 concrete bridge 42-34 over a canal, 44' southwest of the center line of the highway and 14' northwest of the bank of the canal. Reading on the disc.
249. Three Rocks Junction, USGS Cantua Triangulation Station...	979.7814	36° 30.10'	120° 23.26'	417'	-67.5
					At the junction of State Highway 33 and Clarkson Road on the northwest corner. Reading taken by the disc on the ground at the same elevation.
250. Coalinga, USC&GS J-156-----	979.7405	36° 08.78'	120° 21.21'	665.2'	-63.0
					At Coalinga in the "Y" formed by the junction of Forest Street and State Highway 33, 200' south of the center of the junction and 14' south of the north end of a concrete traffic island. Reading 0.4' below disc on sidewalk.



## SANTA CRUZ—Continued

Station	Observed gravity	Latitude	Longitude	Elevation	Simple Bouguer anomaly
1. Coalinga, USGS 671.058.....	979.7400	36° 08.35'	120° 21.47'	669.3'	-62.6
	At Coalinga 59 yards northeast and across Fifth Street from the Southern Pacific Co. Railroad station. 83' north of the center of the crossing of Fifth Street and 42' northwest of the northwest rail. Reading on the ground, 0.8' below disc.				
2. Hollister, USC&GS C-698.....	979.8384	36° 51.19'	121° 25.15'	278.9'	-49.2
	On State Highway 156 1 mile west of Hollister in front of a house numbered 1310, 33' north of the center line of the highway. Reading beside disc on ground.				
3. Hollister Pendulum Station, US-255.....	979.8389	36° 51.12'	121° 24.20'	288.1'	-48.0
	In San Benito County Hall of Records building in Hollister between Fourth and Fifth Streets, in the vault in the basement. Location of pendulum station.				
4. Santa Cruz Co. Court House, USC&GS "Santa Cruz".....	979.9397	36° 58.51'	122° 01.52'	16.6'	+25.8
	At Santa Cruz at the intersection of Pacific and Cooper Avenues in the northwest corner of the County Court House yard 40' east of the center line of Pacific Avenue and 34' south of the center line of Cooper Avenue in the concrete base of a flag pole. Reading on the disc.				
5. Santa Cruz, USGS SF-18.....	979.9396	36° 58.49'	122° 01.52'	15.5'	+25.7
	At Santa Cruz in the northwest corner of the first building facing Pacific Avenue south of the County Court House. Reading 1.95' below disc on concrete driveway.				
6. Santa Cruz, USGS 14.....	979.9356	36° 57.89'	122° 01.51'	13.3'	+22.4
	At Santa Cruz, at the intersection of Pacific Avenue, Washington Street, and West Cliff Drive, 33' west of the center line of Washington Street, 21' east of center line of West Cliff Drive and 0.5' east of a retaining wall on the east side of West Cliff Drive. Reading 0.6' below disc on ground.				
7. Salinas City Hall, USC&GS N-21.....	979.8580	36° 40.54'	121° 39.35'	49.9'	-28.0
	At Salinas City Hall 40' east of the main entrance and 6' west of the sidewalk leading to the building. Reading on the sidewalk 5' south of the disc at the same elevation.				
8. Salinas Federal Building.....	979.8573	36° 40.43'	121° 39.36'	50'	-28.4
	At the east entrance to the Federal Office Building at the northwest corner of Lincoln Avenue and Alisal Street in Salinas. On the south side of the sidewalk at the bottom of the concrete steps.				
9. Monterey Airport (Woollard Airport Base WA-84).....	979.8691	36° 35.23'	121° 50.89'	171.8'	-1.9
	On the sidewalk by the curb in front of the east front entrance to the terminal building at the Monterey County Airport.				
10A.* Monterey Pendulum Station, US-254.....	979.8898	36° 36.0'	121° 53.8'	26'	+9.0
	In Monterey in the old Volunteer Fire House (now an annex to Montgomery Ward Store) on the Calle Principal, south of Franklin Street. Reading on basement floor next to entrance to small sub basement room about 7' above pendulum station.				
11. San Lucas Pendulum Station, US-253.....	979.7932	36° 07.76'	121° 01.18'	408'	-24.3
	The original station was in the basement of the Pleasant View Hotel opposite the railroad station in San Lucas. This building is now demolished and this reading was taken on the sidewalk near the southeast corner of a quonset hut located at the site of the old hotel.				
12.* San Lucas Railroad Station, USCGS G-154.....	979.7932	36° 07.73'	121° 01.12'	405.8'	-24.3
	At San Lucas, 170' southeast of the railroad station, 120' north of the railroad crossing of State Highway 198, 34' northeast of track and in line with a row of telephone poles. Reading taken on ground beside disc and at about same elevation.				

## SANTA CRUZ—Continued

Station	Observed gravity	Latitude	Longitude	Elevation	Simple Bouguer anomaly
359.* Soledad, USC&GS G-22.....	979.8203	36° 25.54'	121° 19.72'	186.8'	-35.9
At Soledad, opposite the Southern Pacific Railroad station, 250' west of the track in the top of a concrete pier which at one time supported a water tower. Reading on the disc.					
SANTA MARIA					
318. Las Cruces, USC&GS D-1043....	979.6787	34° 30.32'	120° 13.55'	302.1'	-6.9
At Las Cruces on the west side of US Highway 101 at the junction of State Highway 1. In the top of the east end of the north concrete curb of the bridge over Gaviota Creek. Reading on the disc.					
353.* Santa Maria Post Office, USC&GS K-532.....	979.6990	34° 57.04'	120° 26.18'	215.2'	-29.5
At Santa Maria, at the southeast corner of the intersection of West Cypress Street and South Lincoln Street, at the U.S. Post Office building, set vertically in the west face of the concrete foundation, 1' north of the southwest corner of the building. Reading taken on ground, 0.5' below disc.					
354.* Santa Maria City Hall, Bench Mark I, City of Santa Maria...	979.6987	34° 56.98'	120° 26.04'	217.7'	-29.6
At Santa Maria at the southeast corner of the intersection of Broadway and Cook Streets, at the City Hall, in the top of a concrete step leading to the west entrance, about 56 yards east of the east curb of Broadway Street, about 16 yards south of the south curb of Cook Street. Reading taken on brass disc which is stamped "1".					
SANTA ROSA					
133. Kelseyville, USGS H-41.....	979.9708	38° 58.69'	122° 50.25'	1382.5'	-36.3
At Kelseyville on the south side of State Highway 29, at the northwest corner of the Bank of America Building. Reading 3.45' below disc on sidewalk.					
134. Lower Lake, Union High School, USGS H-35.....	979.9665	38° 54.85'	122° 36.41'	1375.1'	-35.4
At Lower Lake, at the Lower Lake Union High School, in the south banister of the steps to the front entrance and 6' west of the west wall. Reading taken on disc 2.5' above ground level.					
135. Middletown, USGS 94-M.....	979.9832	38° 45.15'	122° 36.85'	1105'	-20.6
At Middletown at the southwest corner of the junction of State Highways 29 and 175 in the sidewalk. Reading on the disc.					
136. Point Arena, USC&GS G-630...	980.0786	38° 54.73'	123° 41.50'	219'	+7.6
At Point Arena Elementary School on the first concrete step at the west entrance to the building. Reading on the disc about 0.6' above ground level.					
137. Preston, USC&GS T-105.....	980.0384	38° 49.83'	123° 0.75'	332.3'	-18.7
1.9 miles north along the Northwestern Pacific Railroad from Cloverdale at Preston, 28' west of the track at a fence line. Reading taken on the disc.					
138. Cloverdale, USC&GS U-105.....	980.0384	38° 48.36'	123° 0.67'	318.8'	-17.3
At Cloverdale on Lake Avenue, 120' west of the Northwestern Pacific Railroad track in the north face of a brick warehouse, 4' west of the northeast corner of the building. Reading on the ground 3.0' below disc.					
139. Stewart's Point, USGS 138-M....	980.0815	38° 39.12'	123° 23.91'	109.0'	+26.7
At Stewart's Point on State Highway 1, 40' west of the junction of a road leading northeast, 11' southeast of a store and Post Office in the concrete platform for a gasoline pump. Reading on the disc.					

## SANTA ROSA—Continued

Station	Observed gravity	Latitude	Longitude	Elevation	Simple Bouguer anomaly
Fort Ross, USC&GS X-608, Reset	980.0564	38° 31.35'	123° 15.60'	145.6'	+15.3
	1.2 miles northwest along State Highway 1 from Fort Ross, 19' south of the center line of the highway. Reading 0.6' below disc on ground.				
Fort Ross, USC&GS L-208	980.0561	38° 30.84'	123° 14.56'	113.3'	+13.7
	At Fort Ross on State Highway 1, on the south side of the Fort, about 250' south of the old Russian Chapel, 38' southeast of the center line of the Highway and 20' north of the stockade. Reading on the disc.				
Santa Rosa Post Office, USC&GS V-106	980.0203	38° 26.40'	122° 43.00'	157.3'	-12.9
	At the old Post Office building in Santa Rosa, at the northeast corner of the intersection of 5th and A Streets, on the south wall at the southwest corner of the building. Reading on sidewalk 4.2' below disc.				
Santa Rosa—Sonoma Co. Court House, USC&GS W-106	980.0193	38° 26.43'	122° 42.77'	166.9'	-13.4
	At the Sonoma County Court House in Santa Rosa, at the north entrance, in the west end of the third step. Reading on disc.				
Santa Rosa Pendulum Station, US-239	980.0207	38° 26.40'	122° 43.00'	158'	-12.6
	At Santa Rosa Post Office at 5th and A Streets in the center of the floor of "new" basement room. Approximate location of pendulum station.				
Bodega Bay, USC&GS V-208	980.0448	38° 19.75'	123° 02.61'	15.6'	+12.8
	On State Highway 1, 0.3 mile south of Bodega Bay Post Office, 20' southwest of the center line of the highway and 103' northwest of the north corner of Tides Restaurant, by a transformer pole. Reading on ground 0.8' below disc.				
Petaluma Post Office, USC&GS JJ-107	980.0332	38° 13.92'	122° 38.19'	12.2'	+9.5
	At the Petaluma Post Office south of the door to the east entrance near the second basement window in the top of a sandstone railing on the concrete retaining wall, 1' east of the building. Reading on ground 0.2' below disc.				
Petaluma, USC&GS J-107	980.0330	38° 13.95'	122° 38.15'	12.1'	+9.3
	At Petaluma, at the west edge of the city park on D Street, midway between 3rd and 4th Streets. 36' east of the center line of D Street. Reading on the disc about 6" higher than ground level.				
Calistoga, USGS 354	980.0084	38° 34.53'	122° 34.78'	361.4'	-24.5
	On the southwest side of State Highway 128 (Foothill Boulevard), just west of the junction with State Highway 29, leading east to Calistoga. Reading taken on ground 0.6' below disc.				
Napa Co. Court House, USGS 20	980.0082	38° 17.88'	122° 17.06'	17.1'	-20.9
	At Napa at the intersection of Brown and 2nd Streets, at the County Court House, set vertically in the northeast concrete wall 3' southeast of the north corner of the building. Reading taken 3.6' below disc on sidewalk.				
Fairfield—Solano Co. Court House, USGS 15 = 15.632	980.0007	38° 14.98'	122° 02.34'	14.5'	-24.4
	At the Solano County Court House in Fairfield at the T junction of Texas and Union Streets, at the southeast corner of the building, 66' east of the main Texas Street entrance. Reading on the ground 0.9' below disc.				
Fairfield, USC&GS R-789, Reset 1959	980.0019	38° 14.95'	122° 02.94'	17.8'	-22.9
	At Fairfield 0.5 mile southwest along State Highway 12 from the County Court House, at a concrete bridge over a creek. Reading taken on the disc in the sidewalk at the southwest end of the bridge rail, 40' southeast of the center line of the highway.				

## SANTA ROSA—Continued

Station	Observed gravity	Latitude	Longitude	Elevation	Simple Bouguer anomaly
152. Vallejo, USC&GS Z-466.....	979.9960	38° 05.44'	122° 12.64'	172.0'	-5.7
	At the northwest corner of Carquinez Cemetery, on Benicia Road, 1.1 miles east of the intersection of Interstate Highway 80, at Vallejo, 41', south of the center line of Benicia Road. Reading on the disc about 1.3' above the ground.				
153. Tomales, USC&GS V-631.....	980.0349	38° 14.79'	122° 54.23'	79.0'	+14.0
	At Tomales at the Bank of America Building in the concrete sidewalk near the northeast corner of the building. Reading on the disc.				
154. Point Reyes, USC&GS U-476.....	980.0284	38° 03.90'	122° 48.23'	18.4'	+19.7
	On the east end of the south abutment of Bridge No. 2723, over Lagunitas Creek, at the junction of State Highway 1 and Sir Francis Drake Highway, 0.3 mile south of the Post Office at Point Reyes Station. Station on the top of concrete curb 1.2' above disc.				
<b>TRONA</b>					
279. Inyokern Junction, USC&GS P-291.....	979.4863	35° 38.66'	117° 52.80'	3011.0'	-133.4
	On the east side of State Highway 14, 0.45 mile north from its junction with the new highway Inyokern, at the junction of an old abandoned road to Inyokern, 158' east of the center of the road junction. Reading on ground by the disc.				
280. Inyokern Railroad Station.....	979.5197	35° 38.84'	117° 48.68'	2435'	-134.8
	At the Inyokern Railroad Station on the south end of the concrete slab at the southeast entrance to the building. Track level.				
281. Jubilee Pass Junction, USC&GS S-672.....	979.7211	35° 53.98'	116° 39.31'	29.0'	-99.4
	At the southeast corner of a road junction 4.1 miles west of Jubilee Pass in Death Valley 32' east of a northwest-southeast road and 68' southwest of the road to Jubilee Pass. Reading on ground 1' below disc.				
282. Shoshone, USC&GS W-682.....	979.6390	35° 59.80'	116° 16.47'	1638.3'	-93.3
	About one mile north of Shoshone along State Highway 127, in the triangular junction formed by a road leading west to Death Valley. Reading on ground 0.3' below disc.				
283. Ibex Pass Junction, USC&GS Z-684.....	979.6939	35° 37.98'	116° 17.40'	474.2'	-77.0
	At the junction of State Highway 127 and the Ashford Mill Road, 66' south of the center line of the Ashford Mill Road and 45' west of the center line of State Highway 127. Reading on ground, 1' below disc.				
284. Baker, USC&GS Y-162.....	979.6347	35° 15.93'	116° 04.68'	923.0'	-78.0
	At Baker on the abandoned Tonopah and Tidewater Railroad, north of Interstate Highway 1 118' north of the north end of a former section house and 37' east of the center line of the former main track. Reading on the ground, 0.4' below disc.				
<b>UKIAH</b>					
57. Leggett, USC&GS F-254.....	980.0772	39° 52.09'	123° 42.75'	945.1'	-34.9
	At Leggett at the junction of US 101 and State Highway 1, 15' northeast of the corner of a store at 30' south of the center line of Highway 1. Reading on the mark, but mark may be out of place because this location does not agree with USC&GS description.				
58. Leggett, USC&GS T-102.....	980.0672	39° 50.96'	123° 42.41'	1125.7'	-32.4
	On US Highway 101, 1.8 miles south of the post office at Leggett, 110' north of the center line of Highway 1, 59' east of the southeast corner of the Cedar Creek Service Station. 18' east of a driveway. Reading on the disc.				

## UKIAH—Continued

Station	Observed gravity	Latitude	Longitude	Elevation	Simple Bouguer anomaly
9. Westport, USC&GS A-231-----	980.1400	39° 38.15'	123° 46.94'	114.7'	-1.3
	At Westport on State Highway 1, 29' north of the center line of the highway, 75' west of the center line of a side street, in the center of the highway side of a vacant lot. Reading 0.4' below disc on ground.				
0. Fort Bragg, USC&GS J-231-----	980.1426	39° 26.86'	123° 48.30'	77.9'	+15.7
	At Fort Bragg, 54' west of the center line of Main Street, and 50' northwest of the center line of the California Western Railroad track. Reading on ground 0.2' below disc.				
1. Fort Bragg, USC&GS B-210-----	980.1425	39° 26.85'	123° 48.30'	79.0'	+15.7
	At Fort Bragg, 43' west of the center line of Main Street, 19' southwest of the center line of the California Western Railroad track. Reading on ground, 0.3' below disc.				
2. Willits, USC&GS G-104-----	980.0056	39° 24.76'	123° 21.14'	1374.9'	-40.3
	At Willits at the southeast corner of Main and Commercial Streets, at the Bank of Willits Building, in the north wall east of the door. Reading on sidewalk, 3.6' below disc.				
3. Willits, USGS 2-S-----	980.0057	39° 24.81'	123° 21.05'	1369.3'	-40.7
	At Willits in the City Park on the east side of the concrete base of the flag pole. Reading on the disc which is stamped "1369.052 2-S 1924".				
4. Willits Pendulum Station, US-237	980.0053	39° 24.68'	123° 21.14'	1377'	-40.4
	At Willits in a concrete building called the White House, on the east side of Main Street. Reading taken on a small concrete floor behind Elmo's Lunch on the north side of the building. Approximate location of pendulum station.				
Elk, USC&GS W-206-----	980.1133	39° 08.69'	123° 43.94'	180.1'	+19.3
	1.6 miles north along State Highway 1 from Elk at entrance to a Catholic cemetery. 30' southwest of the center line of the highway. Reading on ground 0.5' below disc.				
Ukiah, Mendocino Co. Court House, USC&GS Z-104-----	980.0330	39° 09.02'	123° 12.44'	635.7'	-34.1
	At the County Court House in Ukiah at the School Street entrance on the south end of the first step. Reading on the disc.				
Ukiah, USC&GS Y-104-----	980.0333	39° 09.00'	123° 12.45'	635.8'	-33.8
	At Ukiah on the southwest corner of Perkins and School Streets, at the Masonic Building, now Montgomery Ward Store, in the north face of the building. Reading on sidewalk, 3.6' below the disc.				
Corning, USC&GS R-841-----	980.1178	39° 55.68'	122° 11.21'	277.9'	-39.6
	In Corning at the northwest corner of Solano Street and Houghton Avenue in the south face of the Veteran's Memorial Building, near the west edge. Reading on ground, 3.1' below disc.				
Willows, USC&GS X-199-----	980.1055	39° 32.15'	122° 11.53'	134.7'	-25.7
	About 1.1 miles north along the S.P. track from the Station at Willows, 32' east of the center line of US 99W and 14' north of a private road leading east. Reading on ground by disc.				
Willows, USC&GS T-852, Reset 1960-----	980.1058	39° 31.48'	122° 10.95'	132.6'	-24.6
	One mile east of Willows on the north side of State Highway 162, in the top of the northwest end of a concrete bridge over an irrigation canal. Reading on disc.				
Colusa Park, USGS 58-B-----	980.0764	39° 12.93'	122° 00.78'	58.4'	-31.0
	At Colusa in the City Park on Market Street, 102' west of the intersection of 9th Street, 10' south of the south sidewalk on Market Street. Reading on ground, 0.6' below disc.				

## UKIAH—Continued

Station	Observed gravity	Latitude	Longitude	Elevation	Simple Bouguer anomaly
72. Colusa Co. Court House, USGS 60-B-----	980.0775	39° 12.85'	122° 00.46'	60.6'	-29.8
At the Colusa County Court House, 15' west of the front entrance on Market Street. Reading on sidewalk 0.6' below USGS disc marked "61.009, 60-B, 1904".					
73. Williams, USGS H-65-----	980.0513	39° 09.17'	122° 09.52'	89.1'	-48.8
At the west edge of Williams on the north side of State Highway 20 at a grammar school, 47' south and 18' west of the southwest corner of the building. Reading on top of disc.					
74. Wilbur Springs, USGS H-58-----	979.9808	39° 00.68'	122° 21.69'	1054.6'	-48.9
On State Highway 20 about 340' southwest of the Bear Creek Bridge, 47' southeast of the center line of the highway, near the northwest corner of a corral, and at a fence line. Reading on ground, 0.7' below disc.					

## WALKER LAKE

98. Al Tahoe, USC&GS J-837, Reset 1957-----	979.5143	38° 56.51'	119° 58.58'	6259.2'	-197.0
At Al Tahoe on US Highway 50 at entrance to the El Dorado County camp grounds. 60' north of the center line of the entrance drive and 40' east of the center line of the east lane of the highway. Reading on ground 0.4' below disc.					
99. Markleeville, USC&GS H-194-----	979.5237	38° 41.60'	119° 46.65'	5501.1'	-211.2
At Markleeville on State Highway 4 at the south side of town in the top of the west end of the north-west wing wall on a concrete bridge No. 3102. Reading on the disc.					
100. Carson Pass, USC&GS N-183-----	979.3704	38° 41.65'	119° 59.27'	8574.2'	-180.2
At the summit of Kit Carson Pass on the south side of State Highway 88, on the base of the Kit Carson granite monument. Reading on the stone base 0.1' below disc.					
101. Ebbetts Pass, USC&GS T-194-----	979.3227	38° 32.65'	119° 48.72'	8730.9'	-205.2
At the summit of Ebbetts Pass on State Highway 4, 28' northwest of the center line of the highway. Reading on ground 0.6' below disc.					
102. Sonora Junction, USC&GS M-491-----	979.3815	38° 21.06'	119° 26.92'	6885.3'	-240.3
At Sonora Junction 0.2 mile north along US Highway 395 from the junction of State Highway 108 at the Sonora Junction Division Highway Maintenance Station, 48' east of the center line of the highway, just north of an entrance drive. Disc not found but reading taken by witness post.					
103. Bridgeport, Mono Co. Court House, USGS 6465-----	979.3956	38° 15.38'	119° 13.69'	6467.6'	-242.9
At the Mono County Court House in Bridgeport at the southwest corner of an offset in the west wall, 2' south of the south face of the wall. Reading on ground 0.7' below disc.					
104. Sonora Pass, USC&GS X-913-----	979.2350	38° 19.68'	119° 38.17'	9642.8'	-219.3
At Sonora Pass summit along State Highway 108 on the top of a 4' X 5' granitic boulder. 115' southwest of the center line of the highway. Reading on the disc.					
105. Dardenelles, USC&GS K-917-----	979.4843	38° 20.42'	119° 49.91'	5764.8'	-203.7
At Dardenelles at the south end of a traffic island formed by State Highway 108 and driveways leading to post office and store, 94' southwest of the center line of the highway. Reading on the disc.					

## WEED

1. Crescent City, USC&GS M-73-----	980.3006	41° 45.42'	124° 12.03'	43.9'	-34.2
At Crescent City at the intersection of Ninth and H Streets, at the entrance to a high school building in the top of the balustrade at the south end of the concrete steps. Reading on the disc about 2.5' above ground level.					

## WEED—Continued

Station	Observed gravity	Latitude	Longitude	Elevation	Simple Bouguer anomaly
Crescent City, USC&GS Tidal 6	980.3047	41° 44.95'	124° 11.91'	10.2'	-31.4
At Crescent City, across Front Street from the intersection with D Street on the sea wall, 9' behind the street curb. Reading on disc 1.6' above ground level.					
Gasquet, USC&GS B-73	980.2488	41° 50.75'	123° 55.34'	507.9'	-60.0
At the southwest corner of the bridge over the middle fork of the Smith River (Bridge No. 1-10), about 2.9 miles northeast of Gasquet on US Highway 199. Reading at pavement level, 0.7' below disc.					
Hornbrook, USC&GS A-35	980.1239	41° 54.58'	122° 33.28'	2154.2'	-97.9
At Hornbrook in front of the old Hotel Hornbrook in the top of the southeast end of a concrete sidewalk, about 50 yards west of the S.P. Company Railroad station. Reading on disc.					
Yreka, USC&GS B-865	980.0870	41° 43.95'	122° 38.01'	2596.3'	-92.3
At Yreka at the City Hall on Main Street (Interstate Highway 5) on the east side of the street. On the top of the center of the south column of a step banister at the main entrance. Reading on disc about 1' higher than the ground level.					
Weed, USC&GS A-13	979.9774	41° 25.72'	122° 23.15'	3466.0'	-122.6
At Weed along the S.P. Company Railroad, 360' northwest of the station, between 2 spur tracks, about 92' southwest of and across the tracks from the northwest end of a frozen food locker building, in the top of 1 of 4 concrete blocks of a former oil tank foundation. Reading on disc.					
Weed South, USC&GS R-494	979.9639	41° 24.09'	122° 22.80'	3701.2'	-119.6
Along old US Highway 99, 2.4 miles south of Weed. 150' northeast of the center line of US 99, 28' southwest of the railroad tracks, 3 poles northeast of the S.P. Railroad mile post 346. Reading on the disc.					
Mount Shasta R.R. Station, USC&GS G-13	979.9688	41° 18.90'	122° 18.89'	3553.9'	-115.7
At the Southern Pacific Company Railroad station at Mount Shasta, in the northeast face of the concrete foundation, directly under the middle window of the ticket office. Reading on blacktop 0.3' below disc.					
Dunsmuir Railroad Station	980.0491	41° 12.62'	122° 16.21'		
At Dunsmuir, south of the railroad station at a fountain. Reading taken at the top of the steps under an overhead board walk.					
Dunsmuir, USC&GS S-13, Reset	980.0482	41° 12.60'	122° 16.26'	2306.1'	-101.8
At Dunsmuir, on Pine Street, between Sacramento and Florence Avenues, in the northwest concrete wall of the Dunsmuir News Building, 20' southeast of the center line of Pine Street. Reading on sidewalk 1.6' below disc.					

## WESTWOOD

1 Terno, USC&GS J-94	979.7651	40° 51.70'	120° 27.25'	5301.9'	-174.0
0.3 mile south along the Southern Pacific Company Railroad tracks from the station at Terno at the crossing of US Highway 395. 90' north of the center line of the highway and 52' east of the track. Reading on the disc.					
2 Ravendale, USC&GS M-94	979.7605	40° 47.89'	120° 22.22'	5299.4'	-173.1
At Ravendale, at the former location of the Southern Pacific Station on the southwest side of the tracks and north of the access road. Reading on the disc.					
2 Susanville West, USC&GS W-139	979.7772	40° 25.28'	120° 42.06'	4816.1'	-151.8
2.3 miles west of Susanville along State Highway 36, in the top of a flat boulder, 45' northeast of the center line of the highway, 208' northeast of the culvert at station B 193 + 20. Reading on the disc.					

## WESTWOOD—Continued

Station	Observed gravity	Latitude	Longitude	Elevation	Simple Bouguer anomaly
22. Susanville Post Office, USC&GS H-843-----	979.8085	40° 25.15'	120° 39.59'	4259.9'	-153.7
	At the Post Office in Susanville at the main entrance, 53' east of the center line of Lassen Street in the top of the north concrete balustrade about 2.1' above ground level. Reading on disc.				
23. Susanville Veteran's Building-----	979.8100	40° 24.91'	120° 38.74'	4165'	-157.7
	On sidewalk south of the Veteran's Memorial Building on the west side of the base of the steps. This building is on Main Street between North Weatherlow and Grand Streets, directly opposite the high school.				
24. Johnstonville, USC&GS Y-140, Reset 1959-----	979.7989	40° 23.36'	120° 35.21'	4120.5'	-169.0
	At the bridge over the Susan River on the north end of the upstream curb, 5.1 miles southeast from Susanville, along State Highway 36. Reading on disc.				
25. Doyle, USC&GS Y-141-----	979.7595	40° 01.80'	120° 06.00'	4262.1'	-168.0
	At Doyle just east of the Western Pacific Railroad track, 150' north of the station, in the foundation of a water tank, on the second pedestal from the south side. Reading on the ground 3.7' below disc.				
26. Westwood, USC&GS, "Westwood"-----	979.7687	40° 18.12'	120° 59.96'	5085.3'	-133.5
	At Westwood, at the southwest corner of the intersection of Ash and Third Streets, at the Red River Lumber Company, in the northeast corner of the yard. Reading on the disc.				
27. Halsted Flat, USC&GS N-144-----	979.8598	40° 01.25'	121° 04.21'	2862.7'	-150.8
	5.4 miles west along State Highway 70 from Paxton, 50' north of the center line of the highway opposite the junction of a road to Gray's Flat. Reading on the disc.				
28. Chester, USC&GS Y-138-----	979.7743	40° 18.63'	121° 13.70'	4530.0'	-162.0
	At Chester at the west end of the north curb on the bridge over the Feather River. Reading taken 5' west of the disc at the west end of the bridge abutment on sidewalk 0.8' below disc.				
29. Lost Creek, USBPR 4805.37-----	979.7723	40° 15.61'	121° 21.32'	4912.1'	-136.6
	At the Lost Creek Highway maintenance yard, 40' northwest of the center line of State Highway 36, 73' southwest of a road to the yard, 9.1 miles southwest of Chester on Highway 36. Reading 0.6' below disc.				
30. Child's Meadow, USC&GS M-138	979.7764	40° 20.63'	121° 28.72'	4915.3'	-139.7
	On State Highway 36 and 89 about 1.3 miles southeast of Child's Meadow, on the southwest side of the road in top of a large black boulder. Reading taken on the disc on the top of the rock.				
31. Ponderosa, USGS 11-A-----	979.9403	40° 21.10'	121° 46.80'	3302.6'	-73.3
	9 miles east along State Highway 36 from Payne's Creek and approximately 3/4 mile west of the Ponderosa Sky Ranch, 191' east of the culvert at Highway station B-54 + 35, 23' north of the center line of the highway. Reading 0.7' below disc.				
32. Montgomery Creek, USC&GS J-119, Reset 1951-----	980.0194	40° 50.50'	121° 55.38'	2140.6'	-107.6
	At Montgomery Creek on US Highway 299, near the northeast corner of the bridge over Montgomery Creek in the top of the bridge sidewalk. Reading on the disc.				
<b>NEVADA</b>					
349. Reno, Nevada, Airport Weather Station-----	979.6904	39° 30.38'	119° 46.08'	4395'	-182.8
	At the US Weather Bureau Building at the Reno, Nevada, Airport. Reading taken at the south entrance on the east edge of the concrete walk against the wall, east of the door.				



NEVADA—Continued

Station	Observed gravity	Latitude	Longitude	Elevation	Simple Bouguer anomaly
Reno, Nevada, Airport.....	979.6894	39° 30.30'	119° 46.08'	4400'	-183.4
At the southeast end of the front entrance to the Reno, Nevada, Airport, on the concrete walk by the last pillar on the south. (On the building side of the pillar).					
Carson City, Nevada, USC&GS G-323.....	979.6337	39° 10.13'	119° 45.96'	4685.1'	-192.2
At Carson City, Nevada, at the northwest corner of the Civic Auditorium which is on the east side of Carson Street at junction with Ann Street. Reading taken on the ground, 0.7' below disc.					
<b>OREGON</b>					
Medford, Oregon (Woollard Airport Base WA 141).....	980.2363	42° 22.2'	122° 52.2'	1330'	-76.2
At the Medford, Oregon, Airport Terminal Building, under the marquee opposite gate 3, on the field side and to the left of door facing inward.					

o





TW  
24  
C3  
H33  
NO. 90-99  
C. 2

MAY 1966

SUPPLEMENTARY DATA, SPECIAL REPORT 90

DEPARTMENT OF CONSERVATION

## DIVISION OF MINES AND GEOLOGY

FERRY BUILDING, SAN FRANCISCO 94111



## Branch Offices:

SACRAMENTO  
Resources Bldg.  
Ninth and O Streets  
95814

LOS ANGELES  
Junipera Serra Bldg.  
Room 1065  
90012

REDDING  
State Office Bldg.  
2135 Akard Avenue  
96001

## SUPPLEMENTARY DATA, SPECIAL REPORT 90

May 1966

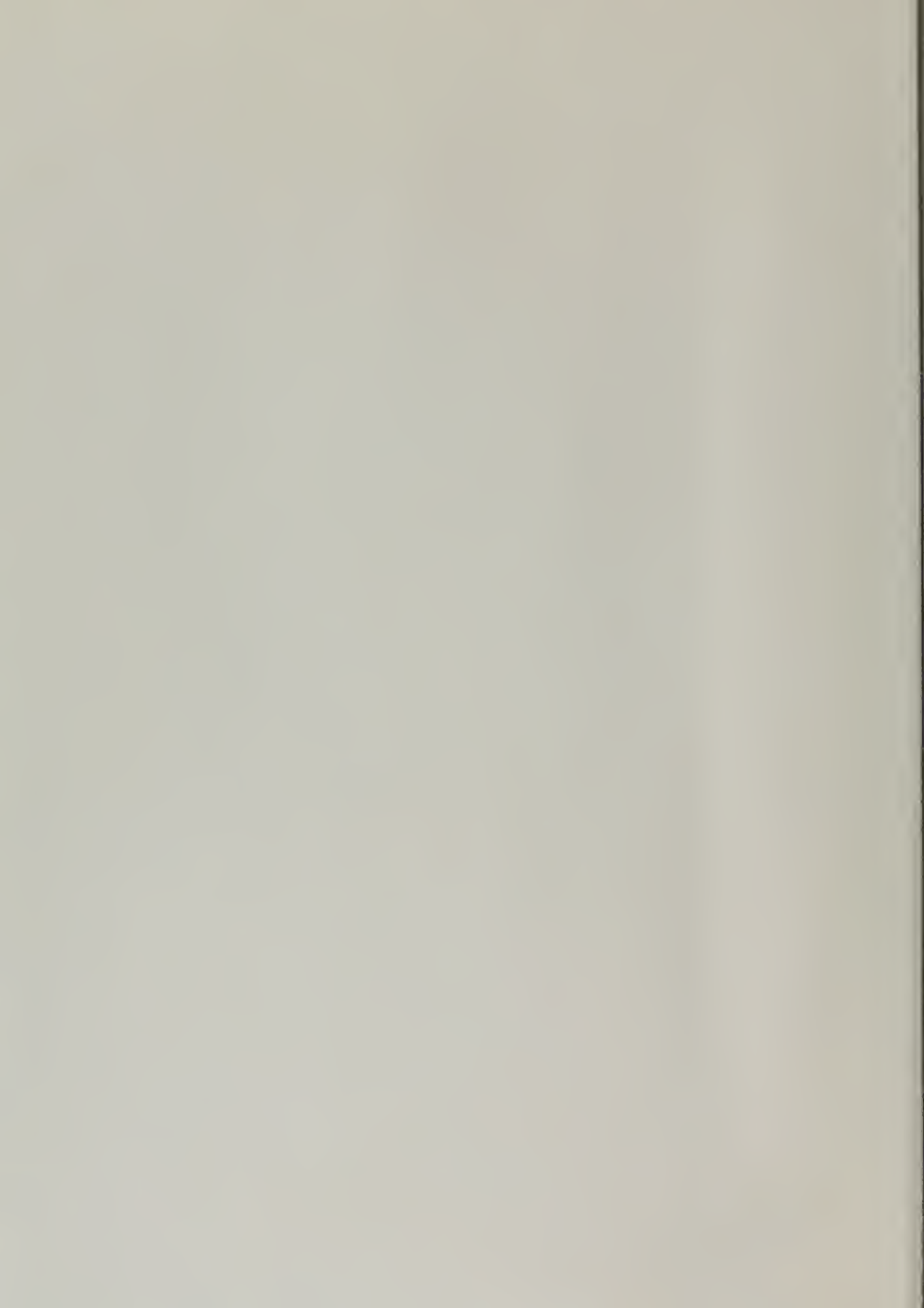
During the period in which this report was being printed, several matters were called to our attention which affect the data presented herein.

The following bench marks are reported to have been lost or removed:

- Page 32. Station 132. Lodi, USGS K9-45B  
(observed gravity should have read  
979.9889 and simple Bouguer anomaly  
-22.6)
- Page 41. Station 251. Coalinga, USGS 671.058
- Page 43. Station 142. Santa Rosa Post Office,  
USC&GS V-106
- Page 43. Station 143. Santa Rosa-Sonoma County  
Court House, USC&GS W-106

In addition, the following changes should be made in the values given in the tables of this book:

- Page 41. Station 259 A. Monterey Pendulum  
Station, US-254. Observed gravity  
should read: 979.8918 and simple  
Bouguer anomaly, ~~10.9~~





SCIENCE  
THIS BOOK IS DUE ON THE LAST DATE  
STAMPED BELOW

BOOKS REQUESTED BY ANOTHER BORROWER  
ARE SUBJECT TO IMMEDIATE RECALL

RECEIVED

APR 03 1992

TIME SERIALIZED

~~MAR 30 1993~~

MAR 26 1993

MAR 30 1999

RECEIVED

MAR 17 1999

FSL

LIBRARY, UNIVERSITY OF CALIFORNIA, DAVIS

Book Slip—Series 458



579118	Call Number:
California. Division of Mines and Geology. Special report	TN24 C3 A33 no.86-

**Nº 579118**

California. Division  
of Mines and Geology.  
Special report.

TN24  
C3  
A33  
no.86-  
90

**GEOLOGY:**

LIBRARY  
UNIVERSITY OF CALIFORNIA  
DAVIS

